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Prof. HENRY BRONSON, M.D.





Henry Bronson.

Prof. HENRY BRONSON, M.D.

At a regular meeting of the New Haven Colony Historical Society held Monday evening, May 26, 1894, the following vote was unanimously adopted :

Voted, That Stephen G. Hubbard, M.D., be requested by this society to prepare a paper commemorative of the professional and personal character of the late Henry Bronson, M.D., and of the service he rendered this society by his valuable contributions to its historical publications.

In compliance with the above request a paper on the foregoing subject was prepared by Dr. Hubbard and read by him at a meeting of this society, held on the evening of May 27, 1895. The meeting passed a vote of thanks to Dr. Hubbard, and requested him to furnish a copy for publication by the society.

HENRY T. BLAKE,
Sec. N. H. Col. Hist. Society.

BIOGRAPHICAL SKETCH
OF THE
LIFE AND WRITINGS
OF THE LATE
PROFESSOR HENRY BRONSON, M.D.
BY
DR. STEPHEN G. HUBBARD.

Read before the New Haven Colony Historical Society, by invitation,
May 27th, 1895.

THE life and character of him in whose memory we are now assembled, have peculiar claims to honorable mention by the wise and good in this community; and particularly by his associates in this society, of which he was one of the corporate members.

He was known as a quiet, unobtrusive gentleman of high character and distinguished attainments—as a man of few words, but of direct and honest thought—and as an advocate of whatever he regarded as abstract truth.

He came to us in the full development of his intellectual faculties, at a time when he impressed all with whom he came in contact, as a man of rare powers of observation, and of acute mental perceptions—of broad and liberal views of public affairs—as a close and logical reasoner, and a lover of equity. Touching this community and the State at so many points as he did, and leaving upon every side the impress of a noble character, the beneficial but unconscious influence of which still remains an active living force, I can but feel, gentlemen, that in accepting your invitation, I have assumed a difficult but honorable and most pleasing duty, in attempting to speak fittingly here of his great wisdom, and of his many virtues.

HENRY BRONSON

Was born in Waterbury on the 30th of January, 1804. He died in this city of the accumulated infirmities of age on the 26th of November, 1893. Like most of the boys of New England of that day, his early youth was spent in assisting his father in the cares of the farm, and in acquiring such an education as was afforded him in the common district school of the town, supplemented by tuition at the Hopkins Grammar School in this city. With these slender opportunities of acquiring knowledge he developed a remarkable love for letters, which continued through a long life, and caused him during the earlier years of his pupilage to expend for books all of his available resources.

At the age of 17 or 18 years, a period when most farmers' sons, unable to endure the rigorous climate, and the severity of discipline administered to them, after which so few lived to be quoted as examples of the "survival of the fittest," he began to shrink in form, and to deteriorate in physical vigor. His health, never strong, became delicate, and the occupations of the farm grew more and more distasteful to him; so that, when the time came that he must

choose for himself a calling for life, he fully realized that the ancestral acres had for him no charms.

His father, Bennet Bronson, Yale 1797, was a lawyer by profession in Waterbury, and was for many years a Judge of the County Court—he was also a large landed proprietor, and a man of wealth and influence. Judge Bronson had already sent two sons to Yale College, both of whom died young, and it was the desire of his heart that this son would remain at home, and take charge of the estate.

But, the intellectual life of the son, so far from being satisfied in its demands by the attractions of a pastoral existence, longed for the mental stimulus and growth to be gained by professional study; and it was only after a critical analysis of his own powers, and a careful balancing of the arguments for and against his natural preference, that he finally adopted for his ultimate pursuit the profession of medicine.

Well knowing his father's long cherished hopes and desires that his son would become so much attached to country life that he would adopt agriculture as a profession,—and knowing also his father's natural intolerance of opposition to his wishes,—and owing to his own native modesty and retiring disposition, being averse to meeting his father with a personal assertion of his own preferences, in opposition to the settled plan of his family, he found himself in a most difficult and unpleasant position.

Under these circumstances he adopted the only course that seemed open to him, and it proved to be a wise one. He addressed to his father a long and dispassionate letter, opening to him his very heart; and offering for his consideration such weighty arguments and cogent reasons why it was the most desirable thing possible for him to study a profession instead of becoming a fixture upon the farm, that the father at once coincided in opinion with his son; and henceforth, every facility for study which the times afforded was placed within his reach. From this day onward the entire current of the boy's thought was deepened, broadened, strengthened and refined by a definite aim in the work of his life.

The choice of a profession marks an epoch of the gravest importance in the career of any young man. It becomes, insensibly to himself, a point of departure as well as of convergence of all the lines that enter into his future history, while hidden indications of native genius, warmed by the promethean fire, are silently assuming form and proportions which are eventually to illustrate and adorn his intellectual life. Thus it was that, in an hour, the entire course of our friend's life was radically changed and intensified.

A judicious line of procedure was defined and followed, and in 1824 he entered himself as a student

in the Medical Department of Yale College, under the instruction of such eminent men as Benjamin Silliman, Nathan Smith and Eli Ives,—these three gentlemen constituting, at that date, the entire faculty of medicine, by whom he was duly graduated with the class of 1827, as a Doctor in Medicine.

Dr. Bronson's first settlement as a candidate for professional employment was in West Springfield, Massachusetts, where he acquired considerable reputation, and in 1831 married Sarah Miles, daughter of Hon. Samuel Lathrop, a wealthy resident of that town, a lawyer and a member of Congress. Another daughter of Mr. Lathrop married Rev. William B. Sprague, D.D., Yale 1815, one of the resident clergymen of Albany, N. Y., and a famous preacher of the day. It was probably this family connection that induced young Bronson to remove to Albany, where he was early invited to become a partner with Alden March, M.D., then and until his death professor of surgery in the Albany Medical College, and the most celebrated surgeon in that portion of the State.

After his removal to Albany, Dr. Bronson occupied his leisure hours by writing for the periodical press articles upon a variety of topics, more or less scientific in their nature, but written in a manner clearly indicating the versatility of his talents; while every

production of his pen attracted marked attention, and was regarded by the public as an earnest of the good things that might be expected from him.

As an illustration of his style of composition and method of reasoning at this early period of his career, and to show how these were admired by some of the best men of the profession outside of his native State, I append some notices by the medical press, and extracts from letters by persons unknown to him. Dr. C. C. Yates, at that time an eminent physician of New York, thus addresses him in October, 1832 :

“I believe that I am indebted to your politeness for a philosophic essay on Medical Logic—(or as the writer of the letter has it), on ‘*reasoning in medicine*.’ This paper I have read with much attention and improvement. Indeed, sir, I confess myself much interested in its perusal, and consequently I tender to you my acknowledgments. If that justice were rendered to your production, which in my estimation it deserves, it would place its author far above his compeers. I admired the language and the *spirit* of your late letters on the Cholera, although differing from me in some practical views, but I was not prepared to see so able a display of logical and argumentative powers as is manifested in this essay by one so young, and of necessity so inexperienced a candidate for medical fame. I see in you the medical philosopher, but the unpopular practitioner—Startle not at my prediction ! It is your creditable independence of mind, of thought, and of expression, that will

probably subject you to the mortification of being excelled by the mean, the sycophantic, and the ignorant in the acquisition of patients.

Nothing but some fortunate turn of circumstances, or an extensive family connection, will enable a person of your standing to cope with folly and licensed quackery. Your paper has been literally used up. I have lent it until it has become *dilapidated and obscurated. It is illegible.* I wish you would oblige me by information where I can procure more copies. I want to send them to both England and France. I received from Boston your paper on disinfecting agents, and have transmitted it to the Board of Health of Savannah, as part of my reply to a letter addressed to me by that body, asking for the best information to guard against and treat the cholera should it appear among them."

Our highest authority in the medical journalism* of that day reviewed the pamphlet in terms of high commendation, and thus quoted freely from its pages :

"We have been favored by Dr. Henry Bronson, of Albany, with a small brochure on Medical Logic, of which we presume he is the author. It is an able production marked by sound reasoning, and is evidently the offspring of a cultivated mind. It should be as widely circulated as possible, being calculated to lead the public to a juster appreciation of medical

* American "Journal of Medical Sciences," May, 1832, p. 270.

science, and a more discriminating judgment of professional capacity."

The following extract will exhibit the object of the writer: "The conclusion," says the doctor, "to which we would bring our remarks is this. The only safety for the public on this momentous subject is to confine the practice of physic to men of truly enlightened and philosophic minds. But this can never be accomplished until the public at large are made more strongly to feel the multiplied and peculiar difficulties attendant on medical inquiries.

It is from *enlightened public opinion alone* that we can hope for the removal of what is an enormous evil in this country—the intrusion (the admission) of ignorant men of weak and undisciplined minds into the medical profession. Public opinion ought to check the facility with which degrees and licences to practice are granted in some of our medical institutions.

How often are men taken from the plough or the anvil with only the bare rudiments of an English education, and in two or three years turned out upon society as the constituted guardians of the public health!

Such men in most cases could not sustain themselves for an hour, either in the profession of divinity or of law. Their utter incapacity for philosophical

investigation would be manifest to all ; but, shielded by the mysteries of a profession which the public eye cannot penetrate, they too gain wealth and influence by the grossest quackery and imposition. If our remarks in this article," he says in conclusion, " shall lead any of our readers to appreciate more highly the amount of mental discipline which ought to be demanded in medical practitioners, our labors will be amply repaid."

These pungent but truthful lines were written more than sixty years ago, in a spirit of righteous indignation over the existence of a monstrous evil which, even in that early time, had begun to cast its shadow over all the colleges of this country, and threatened to become inherent in our entire system of medical education ; nor has this danger wholly ceased—nor is it confined to medical colleges alone.

The descriptive force of his language was true then, and it is true to-day in numerous instances, but not universally ; yet history repeats itself so often that these peculiar crimes against civilization, committed as they have been with impunity and without causing even a blush of shame, or much less the impeachment of the offenders, can neither be forgotten nor forgiven.

So long as politicians are able to worm themselves into respectable and honest college faculties, and to

carry with them the political caucus system, with all which that implies, such things will be repeated; and it ought not to be a matter for surprise, but for alarm, if men without any medical education or training have been able to purchase outright, for silver coin, medical diplomas, issued as the euphonious ritual still has it, "*pro auctoritate mihi commissa*," by medical colleges claiming to be respectable,—while recent events seem to demonstrate that other colleges, less scrupulous, bestow medical diplomas for considerations that will not bear the slightest inspection—and for reasons far less honorable to themselves, but more injurious to the public, because they lead the public mind to form a lower estimate of the honor and ability of the medical profession at large than it deserves.

Dr. Bronson held for many years these opinions, based upon facts that had come within his own knowledge; and thus, in the earliest periods of his professional life, as on all suitable occasions later, he earnestly contended for the prevalence of honest methods of admission to the ranks of the profession; and urged that examinations for degrees should be of such a character, and so conducted, that a diploma in medicine would pass current everywhere as a safe public guarantee that its possessor had been well instructed, and was reasonably well qualified to take into his hands the "care of the public health."

Men die, but institutions live.

Men die, and their histories may die with them. Institutions live; their histories never die—but, good or bad, they live forever—imperishable. It is the influence of such considerations that impart to the every-day facts of common life the power to mould the institutions and the destinies of mankind.

The year 1832 was distinguished by the most disastrous historical event that has characterized any of the years of this century, with the exception of the years of our civil war; for it was in the early summer of that year that our continent was first visited by Asiatic Cholera.

The pestilence was brought to our shores from Dublin, by an emigrant ship arriving at Quebec, having lost on the passage some forty persons by the disease,—the survivors made their way to Montreal. As rapidly as the tidings could be spread by the fleeing people, the disease itself was carried along all lines of communication, until in every habitation, to the hovels of the poor, from the palaces of the rich, the angel of death had set his seal.

At Albany, such was the confidence felt by her citizens in Dr. Bronson's peculiar qualifications for

the investigation of abstruse questions in medical science, and such was the impression he had made upon that critical community, as a man of distinguished ability, that he was commissioned by several prominent gentlemen, at whose head was the Mayor, and directed to proceed to Montreal, and other points in Canada infected with the pestilence, and availing himself of every opportunity to study the natural history of the disease—its modes of propagation—its treatment in the North, together with its results, to report to the committee also such hygienic measures as he would recommend as reliable preventives.

Inspired by a profound sense of his moral obligations to God, and to his fellow men, he promptly accepted this call to duty ; and bidding farewell to his young wife, and to all he held dear, he took his life in his hand, and hastened to the death-stricken city, that he might gather there new knowledge of an unknown and deadly pestilence, for the benefit of his race.

For a good man some may even dare to die ; but to hazard deliberately the extinction of a pure and invaluable life, in order that the victims of every form of vice, wickedness and moral degradation may live, implies the possession of attributes too seldom met with, and indicates the highest possible devotion to duty.

Dr. Bronson's first letter from Montreal was brief, merely announcing his arrival there on the twenty-first of June, and giving his first impressions of the actual conditions in such a crowded city, destitute of sewers, and of all modern sanitary appliances, under the sudden invasion of universal pestilence, and among an ignorant population surrounded by circumstances favorable for the rapid extension and quickly fatal termination of a disease never before seen upon our shores. Under the present advanced state of our knowledge, and the greater familiarity of the public mind with the exigencies of life, it would probably be difficult for us to appreciate clearly the wild terror of our entire population as they helplessly awaited the approach of death, from which they saw no way of escape.

But during the prevalence of the disease, and its progress over our continent, the important fact was observed that, the inmates of prisons in this country and in Europe, who were absolutely cut off from all contact with the outside world, were entirely exempt from the infection.

I was myself old enough to remember the fact that so fully was the condition of *isolation* accepted as the only preventive means possible against the cholera infection, that in many instances men of the highest intelligence stood on guard over their domains, pre-

pared to fire upon all intruders; while placards and watch-dogs served as additional defences. But in their own families no deviations from the accustomed rules of diet, including the use of fresh fruits and vegetables from their own gardens, were permitted. For those who lived sensibly no change in diet or regimen was advised.

The skeptical mind of our philosophic friend refused to receive as facts the unsupported statements of the crowd of observers who pressed forward, each with his bundle of facts, offering to prove that Asiatic cholera was not a contagious disease, but was only a flux common in the summer months, but void of all danger if checked in its early stage by some anodyne astringent nostrum. But another array of real facts, presented by so competent an observer as Dr. Bronson, brushed away this defective reasoning based upon false facts, and brought the profession and the people face to face with the all-important truth that cholera was from the first moment a definite disease—*sui generis*—and not merely a diarrhœa, which if neglected *might* become cholera—it was communicable—and therefore a contagious and infective disease that was conveyed along the lines of public travel by persons and their baggage—was attended by strange symptoms never before seen, and terminated fatally and peculiarly in a few hours.

I need not here go further into his statement of facts and reasoning before the Albany committee; but he early improves the opportunity to disabuse the professional and public mind of the prevalent delusion that the chlorides of lime and soda are in any sense *disinfectants*,—though they may be in some degree useful in dissipating foul-smelling odors. We know, however, that they have no effect to mitigate the dangers of disease.

I do not forget, Mr. President, that I am not addressing a strictly professional audience; nor do I cease to remember with pleasure, that the people of culture who are accustomed to assemble in these halls are always interested in whatever pertains to scientific knowledge, particularly such as relates to discoveries in medical science, or concerns our bodily health, or the personality of those whose lives have been devoted to the work of ministering to the health of others.

I may assume, therefore, that in the endeavor to set before you some of the great qualities of our distinguished friend, neither the events of his professional life in their historical relations to the physical welfare of the world, nor some allusions to the obscure medical theories of the past, could well be omitted.

Dr. Bronson loved with all the force of his moral nature the profession of his choice, and while standing ever ready to break a lance in its defense against

the assaults of presuming ignorance, or the unblushing chicanery of the crafty, he was ever ready to instruct the one, and enlighten or expose the other. He had a remarkable insight into the hidden mysteries of nature, which to many others was a sealed book, and beyond their comprehension. He had also very definite ideas as to the limitations of science and art in the treatment and cure of diseases. He was eminently successful in tracing out the hidden causes of disease, and in palliating their painful or disturbing effects, but I should add, moreover, that he was accustomed to say that he *did not know that he had ever cured anybody*.

While he had an intelligent faith in the powers of a few medicinal agents to relieve the sympathetic disturbances of functions, caused by organic disease or other agencies, he had, in common with all the other great physicians of history, little or no rational faith *in the power of drugs to cure disease*. Freely admitting that recoveries from disease occurred under almost all forms of treatment in proportions somewhat similar, he could not, with all his candor, be an advocate of any exclusive system of treatment.

It has been said of him that, on one occasion, he received from a relative an urgent letter asking for advice in the case of a child sick with the measles, and whose case, it was feared, the attending physician

did not understand, because he was giving the patient a great variety of medicines, at short intervals, and the child was becoming rapidly worse. Without stopping to discuss the merits of this or that pathy, for which he cared nothing, he took a large sheet of paper and wrote in the middle of the great page this prescription :

Take a white china cup
with nothing in it ;
Turn the handle toward the
north-west, and give a
teaspoonful every hour.
The little patient will soon be well.

This was a plain illustration of a great truth contained in the aphorism seldom heard in those days, that “ *the majority of diseases are self-limited—they come and tarry, and disappear according to natural law—if nobody interferes.*”

Let us pause for a moment, and ask ourselves the question, what would be the condition of the human race to-day, if the rise and progress of diseases were *not regulated by law*, and what would doubtless happen to the world if every man were to become a law unto himself, and could, at will, turn the dial backward for two or three thousand years—before medical science was born—to the time when ignorance and tradition were almost the only guides? I very well remember

the dawning of the brilliant light which followed that dark age, when men, entirely ignorant of the universal law that the *majority of diseases are self-limited*, persisted year after year, for successive generations, in their willful, because unthinking blindness, in compelling the defenceless sick to swallow a great variety of nauseous drugs, too often fatal in themselves, while they scrupulously denied to their patients the use of nature's great remedies, *a cup of cold water and a morsel of bread*. It would be interesting to describe to you, did the occasion permit, an hour's debate in which Dr. Bronson held the fixed attention of his audience, in his discussion of the question, "What have been the operation and the controlling influences of natural law in the history and development of the human race?"

During his remarks he spoke solemnly of the responsibility of those men, weak, well-meaning, but industriously ignorant, who closed their minds to the truths of scientific observation, and refused to welcome the light that was pervading the world. But the question reaches a magnitude and importance entirely too great for this occasion, though it affords us a glimpse of the natural scope and grasp of his cultivated mind.

The Albany letters of Dr. Bronson, of which I now present you with the first one of the series of six, were

immediately given to the press, and were copied by all newspapers on this continent and in foreign lands.* They constituted the earliest and most complete dissertation on the nature and treatment of Asiatic cholera then in existence, and written as it were at the bedside, they furnished a graphic account of the unchecked march of the pestilence across the continent, studied and recorded under the careful observation of a most competent investigator. His views of the pathology and proper treatment of cholera were everywhere approved and adopted; and they gave direction to medical practice throughout the world, until in after years they were modified by the great advances made in therapeutic knowledge.

Unconsciously to himself, as I believe, the secondary, but more transient effect of these letters was to cause the name of Henry Bronson to become familiarly known to medical men, wherever the pestilence gathered its victims; and if these events had occurred in the present generation, and if he had so chosen, he certainly would have received, as he would have merited, the highest civic and professional honors that could properly have been conferred upon him.

* In the year 1833, Dr. Martyn Paine of New York published a History of Cholera at Montreal, made up of replies to catechetical questions he had asked of Dr. Holmes of Montreal, with regard to certain points which he evidently desired should correspond to certain previously formed opinions.

Montreal, June 21, 12, M., 1832.

I have now only time to say that I arrived here this morning. Such a scene of desolation as this city exhibits, I never witnessed. Business is entirely suspended; the stores are closed, and the streets deserted. Although this is a holiday with the Catholics, scarcely a human face is to be seen abroad.

The mortality in Montreal by the present disease is unexampled even in the history of the Epidemic Cholera. The number of cases officially reported is about 3,000, and the number of deaths about 800. Many of the physicians, owing to sickness, did not report at all on some of the most fatal days. Besides, a great many have died whom no physician ever saw.

The disease is now evidently on the decline. But few new cases have occurred within the last 12 hours. However within the last 48 hours a much greater proportion of the attacked than before has been the higher orders, and those of temperate and regular habits. Some very valuable lives were lost last night. The disease still prevails to a considerable extent in Laprairie, and is extending rapidly into the country to the south.

I am now about to visit the emigrant's hospital, where numbers lie ill of the worst forms of the epidemic.

[FIRST LETTER.]

Montreal, Friday, 22d June, 12 o'clock M.

GENTLEMEN—It is with pleasure that I can state to you, that the cholera is rapidly abating here. Some of the principal physicians have told me this morning that they had not met with a new case to-day. The cases which now occur are many of them anomalous, assuming the appearance of continued typhus fever. The countenances of the people begin to look cheerful.

During the prevalence of all epidemic diseases, within the limits to which they extend, there is a predisposition, occasioned by the operation of some common causes, to the prevailing disorder. This predisposition may be stronger or weaker, but it

is so strong in all cases, that injurious causes, which were before successfully resisted, are attended with violent or fatal effects, kindling into a blaze the latent seeds of disease. This state is not incompatible with perfect health, though it is commonly manifested, particularly in the more malignant epidemics, by some very unequivocal symptoms. It has been remarked, whenever cholera has appeared on both continents, that the whole population within the sphere of its range, have experienced some of the symptoms which are usually premonitory of its attack, such as griping pains or oppression at the stomach, depraved digestion, etc. This I have noticed in all the regions where cholera has prevailed, from Whitehall to this place. I have supposed these sensations to be independent of anxiety or fear, because I have found them where they could not have been supposed to exist. It is these symptoms which indicate the predisposition to cholera, and which assume the decided character of disease, by the operation of the slightest causes, but which may continue without manifesting such a character if all hurtful agents are carefully avoided. In this condition of the body there is required the most delicate management—a strict regard to a thousand trifling circumstances which at other times would require no attention. The system is in the condition of a delicate balance, the equilibrium of which is disturbed by the weight of a feather.

The causes which have a tendency to disturb this healthy balance, are called by physicians the *existing* causes of diseases. They are as numerous as the agents which are capable of acting on the human system, and are such as food and drink, motion and rest, heat and cold, sleeping and waking, emotions of the mind, etc. On a careful attention to these, everything hinges during the prevalence of a mortal epidemic.

The Montreal physicians saw their importance, and very judiciously insisted on their strict regulation. Those here, who have escaped the malady, probably owe it to the command they exercised over the exciting causes. Excess of every description has been followed by almost certain death. The least irregularity in diet or drink, whether in quality or

quantity, too severe or protracted exercise, bodily or mental, or exposure to a hot sun, etc., have rarely been unattended with injurious or fatal consequences. Those who have presumed on the vigor of their constitution, or yielded in the slightest to an unhallowed appetite, have generally paid the forfeit of their lives. On the contrary, those whose constitution had not been previously impaired by intemperance of any species, whose habits during the epidemic, were sober and regular, whose bodies were not debilitated by too protracted exertion, whose minds were undisturbed by apprehension, escaped almost to a man.

Cholera has stood up here, as it has done everywhere, the advocate of temperance. It has pleaded most eloquently, and with tremendous effect. The disease has searched out the haunt of the drunkard, and has seldom left it without bearing away its victim. Even moderate drinkers have been but a little better off. Ardent spirits, in any shape and in all quantities, have been highly detrimental. Some temperate men resorted to it during the prevalence of the malady, as a preventive, or to remove the feeling of uneasiness about the stomach, or for the purpose of drowning their apprehensions, but they did it at their peril. It is believed never to have done good, but nearly always injury. The slight indigestion which was so common, was best relieved by regulating the kind and quantity of food, and by great moderation in the use of the ordinary drinks.

The disastrous effects of that tampering with medicines which is so prevalent during the ravages of an epidemic, were here witnessed on an extensive scale. This evil was of such serious magnitude, that an injunction was laid on apothecaries not to sell drugs except on the order of a physician. It was a common thing in the commencement of the sickness, for persons in health to take vomits, purges, etc., as preventives. The consequences were often fatal. It was truly considered that a man who is well can not be made better by medicine; but on the contrary, is sure to receive detriment. In almost every instance where severe medicines were taken for the symptoms of predisposition, an attack followed. The system was thus,

as it were, thrown off its balance, and of course put into the very situation in which it is most susceptible to an attack. Let the wares of the apothecary be reserved for the hour of decided sickness. Then, if adapted to the case, they cannot be too promptly used.

Those emotions which agitate deeply and durably the mind, have at all times a very prejudicial effect upon the health ; but when there is a strong predisposition to disease, and during the raging of a sweeping epidemic, they are productive of the worst consequences. That fearful pestilence which is now passing over Montreal, has produced a degree of agitation in the minds of the people, which has probably never been felt before. The stoutest hearts were unable to resist, but were overwhelmed in the torrent. Numerous cases of sickness and many deaths, were the consequence of this high state of excitement. It is impossible to tell in how many instances a predisposition which might never have resulted in anything serious, has been kindled into a blaze from causes purely mental ; but doubtless, this has been the fact in a vast number. It has often been said of cholera, that as many die of fear as of the disease. Though this may not be literally true, yet it may be truly said that hundreds die of cholera *excited* by fear. Its operation is sometimes *indirect*, heightening susceptibility, and laying the grounds of a strong predisposition, or *direct* acting upon a previous predisposition, and proving the immediate cause of an attack of the reigning malady.

Should the cholera ever reach Albany, means to calm the passions, and to produce equanimity of mind and fortitude, cannot be too faithfully used. The public should be prepared for an attack, so that when the enemy comes, they need not be taken by surprise. A panic is of all things to be deprecated.

Yesterday P. M. the board of health reported 84 deaths from cholera for the 24 hours preceding.

P. S. Drs. Rhinelander and De Kay, from New York City, arrived this day.

With great respect, I remain, gentlemen, yours, etc.,

HENRY BRONSON.

[SECOND LETTER.]

Montreal, June 23, 1832.

MY DEAR SIR—The cholera is rapidly subsiding here. Yesterday there were reported 37 burials from cholera. The disease, we hear, is extending in all directions.

The authorities of Albany cannot be too prompt and too vigilant in the purification of the city, in way of preparation for cholera, and though the extensiveness and fatality to the disease are not necessarily in exact proportion to the amount of public and private filth, it is still proved, from a field of observation as wide as the world, that its diffusion is promoted, and its mortality increased by uncleanness, of whatever description. Its generally limited spread in the south of Europe, and particularly in Britain, has been attributed in a great measure (and not without some reason,) to the care and vigilance which was observed in preparing for its reception by removing every source of corruption. Montreal is at the present time in a peculiarly favorable situation for the reception and propagation of cholera, if the accumulation of masses of putrifying materials are indicative of such a situation. Let neighboring cities read an example from her melancholy fate, of the danger of neglecting purity.

All decomposing animal and vegetable relics should be removed without the bounds of the city. They should be *removed* if possible. Nothing short of this will with any certainty effect the desired object. Covering up is calculated to conceal, not to destroy. I have no hesitation in saying that quick-lime and the chlorides should never be trusted to when removal is practicable. It strikes me that the confidence put in them is dangerous, and calculated to divert the mind from the true and only effectual mode of purifying. I dare not say that their use can never be of any service, but I risk nothing in affirming that they are not substitutes for real cleanliness. I well know that the chlorides, in which most confidence seems to be placed, destroy chemically the fetid gases, but I also know that

decomposing animal and vegetable matter gives out an agent or agents of the most deleterious nature independent of those gases, and sometimes unaccompanied by them. This fact is well known among medical men. As for the chlorides destroying the principle of contagion or infection, there is no proof of it. Besides, the principle of contagion is not an elementary or a compounded gas such as chemists are accustomed to catch in their receivers. It is not sulphuretted hydrogen, nor carburetted hydrogen, nor phosphoretted hydrogen, which chlorine is calculated to decompose, but a specific animal secretion, *sui generis*. All which is said in respect to the chlorides is said with a reference to the *present* evidence in their favor. They have been used here during the prevalence of the present epidemic to a considerable extent, but without any known good effect. The Montreal physicians, as far as I know, put no confidence in them.

Of the efficacy of free ventilation as a means of cleanliness I need say nothing. As a preventive to the introduction and spread of epidemic and contagious diseases, and of cholera in particular, and as possessed of a modifying influence upon their character, it deserves intent consideration.

I take it for granted that there will be provided in Albany, in anticipation, comfortable and commodious receptacles for the sick poor. When the cholera broke out in Montreal, nothing was provided in this way, nor indeed for many days afterwards. For the want of a hospital patients were carried into the open field, and left to die uncovered. At last some sheds of rough boards were erected without flooring, with holes sawed in the ends for doors, and in the sides for windows. Some straw was laid upon the ground and the sick placed upon it, when of course they soon saw the end of their misery. It afforded little protection from the rain. Such wretched hovels for the reception of those ill of so severe a disease as cholera, requiring for its cure assiduous attention and all those favorable circumstances which the best regulated and provided hospitals can afford, were little better than nothing. Almost all died who were carried to them.

During the height of the epidemic here many of the physicians were unable to attend to one-half of their calls. They could often do no more than hear a brief statement of the case from a messenger and send the medicine. Frequently they could not do even this. That none need be entirely deprived of the means of relief, depots of medicines were established in various parts of the city, designated by a yellow flag, and placed under the care of a medical student or some trusty persons where those in the neighborhood might resort for remedies. It is true, medicine could be used with little certainty or success under these circumstances, but perhaps the best alternative was adopted.

No efficient measures seem to have been taken here by the authorities or citizens at the onset of the disease, and after it had begun to carry off its scores per day, there was such an universal agitation of mind and paralysis of all the faculties, that nobody was able to act with decision and judgment. In this state of consternation it could not be expected that amends were to be made for previous neglect and inefficiency. Everything that was done appears to have been done with a tremulous hand and with a wavering purpose, plainly indicating the doubt, hesitation and terror which ruled within. Where there seemed to be *action*, there was in truth only *bustle*. Courage was only recklessness. Firmness was but the stupefaction of fear. Every man, looking at his present hour as among his last, was intent only on his own safety. The welfare of his neighbor was a foreign concern. While in this state of anxiety to secure his own life, he was in the very condition in which he was most likely to lose it.

I shall hereafter speak of the nature, origin, mode of propagation, and treatment of cholera in the places I have visited. I will only now say, that from what I have seen, I am persuaded that the disease is often spread by intercourse or contagion from one place to another. Though I have no doubt that it may originate spontaneously, and often does so, at the same time it seems sometimes to be carried from one place to another.

[THIRD LETTER.]

Montreal, June 23.

I feel disposed to put much stress upon what was said yesterday respecting the chlorides, more particularly as I find they are likely to be extensively used and confided in. This confidence I conceive to be misplaced and imminently dangerous. I have heretofore examined this subject with some care, and can find very little testimony in their favor; certainly none which can entitle them to consideration, when we have at our command the more effectual means of cleanliness, such as the removal of the offending cause, ventilation, the free use of pure water, draining, &c. I have enquired again of some of the most intelligent physicians of Montreal, the result of their observations on the use of these supposed disinfecting agents during the present epidemic, but can find nothing calculated to satisfy the minds of those who advocate their utility. Professional opinion is decidedly against them here. Some have supposed that they have actually predisposed the body to an attack of the disease, by their irritating and noxious agency upon the system. This is very probable from the known effect of chlorine upon the animal powers. Though it may not be respired except in minute quantities, yet it should be recollected that during the prevalence of cholera, there is such an exquisite susceptibility to the action of all agents, (the constitution giving way to the current disease by the application of the slightest causes) that an atmosphere containing only a minute portion of the agent so obnoxious to health as this, may nevertheless prove detrimental. It may prove the *feather* which turns the scale against a man who is laboring under a strong predisposition. I hope these remarks will not be set down to the account of prejudice or superficial examination, though they may be founded in error. Whatever be their justness or value, they have been the result of considerable reflection and inquiry. I shall cheerfully ascribe disinfecting powers to chlorine, as soon as a sufficient number of *facts* have been brought forward to establish so important a point; not

before. Its use is at present empirical ; not founded in science, nor the result of deduction from observation. When confided in, it is productive of hazard from the neglect of true purification which it induces. If an ounce or two of chloride of lime is supposed adequate to render any quantity of filth innoxious, man, moved by the ordinary labor-saving motives, is easily persuaded to trust to it, and to disregard the only effectual but more laborious process of removing the offending substance.

Fires were kindled and cannon and musketry discharged here during the height of the epidemic, to disinfect, as it was said, the atmosphere. These means have been often used for the same purpose during the raging of pestilence, but with no known advantage. Tar and sulphur were burned with the same design, and with a similar effect. Camphor was a favorite article with the timid ; that is to say, with a great part of the community. It was put into a bag and worn round the neck ; it was carried in the pocket ; it was sprinkled in the handkerchief. If two passed each other in the street, the nose was diligently plied with the camphor bag by the respective parties. Every straggling beggar or unfortunate emigrant was supposed to personify the cholera, and if dire necessity rendered it necessary to approach him, the camphor bag was an indispensable companion. It would have been well had these "preventives" been attended with only negative effects. It is the opinion of some of the physicians that they were sometimes positively injurious. Some of them exhale noxious fumes, which when respired act injuriously upon the system. The effluvium of camphor is powerful and penetrating, which cannot but do harm when constantly in contact with the sensible olfactories. The same objection may be made to all those substances which give out strong and disagreeable odor, which was made to the chlorides, with respect to their effects on predisposition.

I have before alluded to the too frequent and indiscriminate use of medicine as a preventive in cholera. This was carried to a most absurd and dangerous extreme in Montreal. Every man had his phial, or his pill box, or his powders of different

kinds, in his pockets. Literally, he carried about with him an apothecaries shop. Whenever he perceived a bad odor, or felt a disagreeable sensation at the stomach, or imagined he did so, he suddenly stopped, felt his pulse, pulled out his medicine, swallowed a dose, smelt his camphor, felt his pulse again and hastened on. The sight of medicine and the act of taking it, operating on the common principle of association, brought *Cholera* up before the diseased imagination with increased vividness. This mental impression, reacting again upon the body, magnified the difficulty, and gave a new demand for the anti-choleric medicine.

It is believed that apothecaries did an immense deal of injury by advertising and recommending their nostrums as preventives of cholera and as specific in its cure. A hundred different preparations, some of them inert, some of them powerful, were in this way distributed among the community, with directions recommending them to be taken once in so many hours, as a preventive or as a cure of the disease. Editors, too, scraped together and published all the recipes which could be had. Individuals volunteered their advice and stated their experience. Thus the public mind was distracted and almost enraged. No one could tell, among the multiplicity of the means of safety which were about him, where to put his reliance. Alternately moved by hope and by fear, by faith and doubt, by confidence and distrust, he at times seized upon this thing and at times upon that. Some, that they might be sure to get hold of the real specific, with more *sang froid* than was common, diligently gathered up all the anti-cholera compounds which they could find, and used the whole as directed, either together or in succession.

I am not opposed to the using of medicine without professional advice in cases of sudden attack when a physician is not at hand; on the contrary, I am much in favor of it, provided it be judicious and its design be understood. But certainly, matters should not be transacted as they have been in Montreal. The dreadful consequences which are supposed to have resulted from the mode in which drugs have been distributed

and taken, and ill-judged advice diffused and received, should prompt other cities to the adoption of some means to prevent a repetition of the like evils.

[FOURTH LETTER.]

Albany, June 30th, 1832.

GENTLEMEN—It is with great pleasure that I have complied with your request and have drawn up the accompanying communication, giving the results of my enquiries and observations while executing your purpose in my late visit to Montreal and the other seats of the cholera. Though the facts which it contains have been arranged and committed to paper with considerable haste, they were collected with much care.

With sentiments of the highest respect and esteem, I remain
yours, &c.

HENRY BRONSON.

It seems the present cholera of the north first made its appearance on any considerable scale at Quebec. The facts as far as I can collect them are these :

The steamboat *Voyageur* started from Quebec to Montreal, heavily loaded with passengers (emigrants), all of them apparently healthy. They were a motley group from almost every nation in Europe. After having proceeded about ten miles, the boat was found to be in danger of sinking from the weight of its burden. The water had actually began to enter the cabin. A general alarm seized all on board, while shrieks and groans were heard from every part of the vessel. The captain turned about and made for Quebec. He arrived between 12 and 1 o'clock on the morning of the 8th, landed about 150 of the emigrants, and directed his course again up the river for Montreal. On the same day a man among those who were put ashore at Quebec, sickened and died of cholera. The disease immediately became general at that place.

During the passage to Montreal, a man was taken ill on board with the symptoms of cholera, and was taken on shore on the arrival of the boat at that place on the evening of the 9th. The next day, another emigrant, who came up in the

Voyageur the evening previous, was attacked in Montreal with the same disease, which proved fatal in a few hours. This was the first case which occurred in Montreal. The succeeding night and the next day, the disorder appeared almost simultaneously in all quarters of the city. These facts I derived from Capt. Morin, who commanded the Voyageur. They were confirmed by physicians in Montreal who had examined into the subject.

It may be necessary to say that the vessel, James Carricks, which was said to have introduced the cholera into Quebec, was performing quarantine below at the time above mentioned, and for some days afterwards.

During Sunday the 10th, many emigrants who came up in the Voyageur the evening preceding, crossed over to Laprairie, a distance of nine miles, on their way to "the States." On Monday one of them was taken ill, and died of cholera. The same day, but subsequently, an inhabitant who was much about the landing place, was seized in a similar way. The next cases occurred on Wednesday, at which time the disease became general. These facts were stated to me by Dr. Alexander, of Laprairie.

On the 14th an emigrant from Montreal was found sick upon the wharf in St. Johns, and died of cholera. An inhabitant was attacked on the 15th, and another the day following. The malady then spread over the village. This statement was made by Drs. Wamsley and Buckley, physicians in St. Johns.

The first case of sickness in Plattsburgh, which was reported as cholera (though it seems doubtful from the symptoms whether it was a case of that kind), was upon the 12th, in an emigrant who, if his own story be correct (for he is still living), left Montreal on the 7th, two days before the epidemic had appeared in that place. The second case occurred on the 14th and the third on the 15th, both of which were fatal. The others were in immediate succession. My authorities are Drs. Mooers and Kane of Plattsburgh.

On Wednesday the 13th, a family came from Montreal to Burlington. A child belonging to it sickened and died sud-

denly on the 15th. The mother went to Montpelier two days after, was seized with the cholera, and died, as reported by the board of health in that place. On the 16th, a man who lived in the building, or the group of buildings in which the family from Montreal had stopped, and in which the child had died, was found ill in the street of a disease resembling cholera. He survived forty-eight hours. The following day (17th), two others were attacked with similar symptoms, and expired in a few hours. The above four cases, which occurred in Burlington, it is now universally believed were true cholera, though for reasons which it is at present unnecessary to state, they were not so reported at the time. This information I received from Dr. Lincoln of Burlington, a gentleman worthy of all credence.

The facts in regard to the cases in Whitehall are perhaps well known. A Mr. Learned, direct from Montreal, arrived at Whitehall on board the Phenix on the 15th, sick of cholera. He expired in a few hours. An inhabitant was taken with symptoms of the same kind the next morning and died during the day. Though the latter is believed to have had no immediate communication with Learned, yet he is said to have had intercourse, and drank with those who came in the same boat.

The cholera, so far as I have seen or heard, appears in particular families, neighborhoods and streets. The cases are to be found in groups, more than single and isolated. And all this seems to happen, independently of local circumstances, or domestic and personal causes. This, for evident reasons, appears to be more obviously the fact in the country where the population is scattered, than in the city where it is dense. I noticed it particularly in Laprairie. In Plattsburgh, the whole number of undoubted cases, amounting to six, occurred in a little cluster of dirty huts. The same was the fact in Burlington. In Montreal, Dr. Robinson, a highly respectable physician, informed me that the houses in which cholera raged, were in groups, and that the families into which the disease had once entered, were almost sure to suffer in more than one instance.

The cholera in America, as in the east, in passing on has taken the great roads of communication. Arriving at Montreal from Quebec, it selected the two principal, and indeed only, thoroughfares across the country. It had marched up the St. Lawrence through Prescott, Brockville, Kingston, taking the great chain of lakes, and south through Laprairie, St. Johns, Plattsburgh, &c., the only direct route to the United States. It has not appeared, so far as I can learn, in any inland or isolated place, except in the persons of those directly from the infected region.

The facts above noticed are precisely like those which may be gathered from every field which cholera has occupied. I state them because they are new individually, not novel in kind. They certainly give evidence that cholera is contagious or infectious (for these terms are in a practical sense synonymous). I am fully aware of the mode in which they will be evaded, not met, by the sceptical, but I have no time now to spend in quibbling. But there is another class of facts, which have an important bearing upon this subject, which it may be worth while to consider.

On the first appearance of cholera in Asia there was of course no contagion. A combination of causes was then in existence which originated the disease. It ceases spontaneously in the southern latitudes every fall, and starts up again in the spring. Why may not the same circumstances which primarily produced it, and have secondarily reproduced it, bring it into existence again in Europe or America? They have done so.

I have the authority of Drs. Robinson and Nelson of Montreal, men of high professional standing, for saying that the cholera appeared there early in the spring of the present year, before the breaking up of the ice in the river, and of course before the arrival of emigrants. One of them believed it at the time true Asiatic cholera, and expected to see it spread, but it disappeared in about eight days. They are both of them now strong in the belief of its identity with their late epidemic. Dr. Robinson saw three cases, Dr. Nelson many more. A number died. The disease was confined to a small neigh-

borhood in one of the suburbs. Dr. Wamsley of St. Johns informed me that he was called to see a man as early as last April, ill of what he then supposed and now believes to have been genuine Asiatic cholera.

Besides, is it possible to suppose that the emigrants who spread the disease in Canada brought it with them from Europe? The latent period of this disease is known to be very short. It is commonly only a few hours, rarely a few days. It is hardly possible to conceive a man to take cholera in Cork or Belfast, cross the Atlantic in perfect health, reach Quebec or Montreal, and there sicken for the first time. It is more probable that the disease was produced by what Sydenham calls the *epidemic constitution* (or that unknown combination of circumstances which originates contagious diseases on their first appearance, and frequently reproduces them afterwards), which we know was intense by the few cases of cholera which sprung up in the spring in Montreal and St. Johns. The strong terror which prevailed among the passengers of the *Voyageur* during their perilous situation, doubtless coöperated powerfully in producing the effect.

The two great classes of facts above alluded to are not at all inconsistent. The doctrines of contagion and non-contagion are easily reconciled. The truth is, almost any febrile disease which becomes epidemic may be contagious under particular circumstances. Typhus is so—dysentery is so—yellow fever and plague are so. Every contagious fever may also, when the epidemic constitution is in a state of great intensity, or the predisposition is very strong, start up without any communication with the infected. This might be proved abundantly (were there room for it) of scarlet fever, measles, whooping cough, and even small pox.

There may be expected from me a brief outline of the symptoms of the disease which I have examined.

A great susceptibility to cholera is common to all who live within the range of its prevalence. It is manifested, as said in a previous communication, by a diminution of appetite, furred tongue, indigestion, oppression about the stomach and

heart, a dingy complexion, etc. If the predisposition is stronger, in addition to these symptoms are griping pains in the abdomen, looseness of the bowels, slight cramps in the calves of the legs, pointed features, etc. There is some variety in the manner of the decided attack. The more regular cases come on with vertigo, followed by a temporary loss of consciousness, some pain in the stomach and bowels, distress about the chest, a sort of struggling in the region of the heart, agitation and perhaps a little fullness of the pulse, etc. 'This is called by the Montreal physicians the stage of excitement; though it might perhaps with more propriety be called the stage of commotion. It lasts commonly ten, twenty or thirty minutes, or longer. Gradually, spasms in the legs and about the stomach come on, copious dejections, at first of the undigested contents of the stomach and bowels, afterwards of a fluid resembling dish-water or rice-water, vomiting of a similar fluid, insatiable thirst, sinking of the pulse, coldness of the hands and feet, gradually extending to the trunk, blueness of the surface. The tongue and breath are cold. A profuse, cold, clammy sweat breaks out, particularly on the extremities. The arteries cease to beat and the heart only vibrates. The hands and feet are much shrivelled, appearing as if they had for a long time been soaked in water, or enveloped in a poultice. The cheeks appear fallen in, the eyes sunken, and the countenance inexpressibly ghastly. Death follows soon. The urine is commonly completely suppressed. The mind seems generally little affected until it is deprived of its means of expression by exhaustion. The duration of the disease is ordinarily from four to eighteen hours.

Sometimes the first stage seems to be passed over, and the second, or blue, or cold stage commences the attack. This is the disease in one of its worst forms. There is sometimes no purging or vomiting or spasms. These are desperate cases, as they show a great want of vital energy. The insidious cases are nearly equally bad, which creep on insensibly, by a protracted, exhausting, and unmanageable diarrhœa.

The Montreal physicians confidently affirm, that they can cure five in six of the cases of cholera, provided they are called at the outset of the disease, and the constitution is not in a state of complete dilapidation. At this time the sweating regimen is often successful. A Dover's powder may be given, the body covered up warm in bed, bottles of hot water applied to the feet, etc. This is the stage in which they bleed, if ever. The physicians in St. Johns think they have used the lancet very successfully at this period

When the vomiting, and purging, and coldness, and flagging of the pulse come on, the remedies must be promptly changed. Bleeding, vomiting, purging, sweating, and any reducing agent, all agree, are out of place. Opium, in some combination or form, is here the sheet anchor. All use it, and all rely on it, more than on any thing and every thing else. However, it requires to be managed with great judgment. The pill, swallowed dry, is commonly preferred. Laudanum enemas are used with advantage. Every thing depends upon promptly arresting the vomiting and purging, and allaying the irritability of the stomach and bowels, and consequently bringing about a gentle reaction—indicated by returning warmth and pulse, etc. For the latter purpose are employed ammonia, ether, the essential oils, hot water blisters, dry heat to the extremities, etc. A position upon the back, perfect quiet, and abstinence from all drinks, are strictly enjoined. If the patient is once raised from the sinking stage, the prospect of recovery is fair, and convalescence rapid.

This is, IN GENERAL, the practice I have witnessed, modified of course to suit individual cases.

Some use calomel in their practice; but it is generally considered too slow in its operation to prove serviceable. Some employ assafætida, and some other things; but they are all commonly auxiliary to the remedies which have been pointed out.

Most of the physicians at the north, whom I have seen, consider their cholera as identical with the scourge of the East; however, many of them look upon it as the common

endemic of the country—cholera morbus in an aggravated form. I know of no solid ground for this opinion. These diseases appear to me as specifically distinct as different diseases ever are. The one is epidemic, the other is never so; the one occurs at all seasons, the other never except in the summer and autumn, unless in a single isolated case, depending upon some irritating substance taken into the stomach; the danger in the one is not necessarily proportionate to the violence of the vomiting and purging, for some of the worst cases, as we have seen, are attended with neither; while that in the other is in direct proportion to the intensity of these symptoms. The peculiar rice-water discharges are almost always present in the one, and very rarely in the other. There are many other points of difference which cannot now be enumerated. It is, however, a question which involves no practical consideration.

I had almost forgotten to remark, what has been observed in the East, that the greatest proportion of attacks from cholera, so far as I have learnt, has been in the morning, between the hours of twelve and four o'clock.

N. B. It will be noticed that nothing has been repeated in the foregoing statement which is contained in my *letters* as published in the Albany papers.

REMARKS ON THE CHLORIDES AND CHLORINE.

The Chlorides and Chlorine as "Disinfecting Agents," and as Preventives of Cholera. By HENRY BRONSON, M.D.

[Communicated for the Boston Medical and Surgical Journal.]

SOME weeks ago, in a series of letters from Canada, I ventured to make some remarks respecting the anti-cholera powers of medicines as preventives. Strong doubts were expressed of their utility, or even safety, whether taken into the stomach or breathed in the form of fumes or gases. Even *chlorine* was thought exceptionable. My object was to shake the public confidence in all *nostrums* and *specifics* for the preservation of

health, and in all *substitutes* for real cleanliness. For all this I was censured. My sentiments were judged heterodox. My object now is to show the *grounds* of my opinions as then expressed, and particularly to state the arguments and the facts which bear upon the question as to the efficacy of the *chlorides* as "disinfecting agents."

It seems to be taken for granted by most non-professional and by many professional men who have thought little upon the subject, that a disease which is ascertained to originate and spread independently of a contagious influence, is of course *atmospherical*. This is entirely a gratuitous supposition, unsupported by a single fact, and contradicted by many obvious truths. If it is said that there is any change in the component parts of the atmosphere, the assertion is destitute of proof. The most accurate philosophical analyses and experiments can detect no alteration. Its proportions are the same where cholera is raging in its direct form, and where no such disease is present. If it is affirmed that a foreign substance in the form of a gas or vapor, or in some other state, is introduced into the air, combining or mixing with it, and by its deleterious action upon the system giving a predisposition to the disease in question, the assertion again is void of proof. No one has ever discovered such substance, and facts would seem to render its existence impossible. Ponderable matter in any shape, even though it be a gas or vapor in the most tenuous form, when diffused in the atmosphere, is subject to the laws of matter. It moves with the element which contains it; it is driven by currents. But can the course of the cholera be calculated by the course of the winds, like the smoke of our chimneys or the clouds over our heads? Is it facilitated or retarded in its march by the motion of the atmosphere? It travels with the same equal and resistless step in the face of the monsoons of India as when aided by the strength of a tempest. It does not receive wings from the hurricane, nor is its flight arrested by a calm.

If I am asked the essential, non-contagious cause of cholera, I answer frankly—I *do not know*. Every agent in nature, real or imaginary, has been accused. Electricity, magnetism,

earth, air, water, sun, moon, planets, comets, have each been arraigned in vain. There is a mystery which hangs over the origin and spread of epidemics, which will probably never be removed. The philosophers of the present day are no wiser on this subject than those who lived three thousand years ago.

There is, then, not a particle of evidence that the general atmosphere where cholera prevails is changed, or contains any impurity. On the contrary, all the evidence which exists upon the subject is against such a supposition. What folly, then—what short of empiricism—to charge the elements we breathe with the smoke of gunpowder, the fumes of tar, brimstone, camphor, with chlorine and every species of stench, for the purpose of *purifying* it and rendering it wholesome ! Does common sense teach us to introduce into the air by which we are enveloped, which contributes to sustain us, and which there is every reason to believe pure, a known noxious substance (chlorine), for the purpose of neutralizing or destroying an unknown something of unknown powers, and of improbable existence ? It scouts the idea.

Among the various substances which from time to time have been brought forward and lauded as “disinfecting agents,” chlorine is perhaps the only one which at the present day deserves attention. The parade of pretended science with which its claims have been urged and defended, and the specious but superficial reasoning with which they have been supported, render its nature and its asserted powers worthy of examination.

Chlorine (the active principle evolved from the chlorides) is one of those acrid and poisonous gases which when respired in any considerable quantities occasion serious derangement in the animal economy, or even destroy life. It produces great irritation of the bronchial passages—manifested by heat, pain, stricture, etc.—which is followed by inflammation and destruction of the function of the lungs. If an animal is immersed in it he dies suddenly of asphyxia. When largely diluted with common air, it occasions cough, dizziness, tightness across the chest, and an urgent desire for fresh air. These effects, if

they do not result in speedy inflammation, or throw the system into some disease to which it may be at the time strongly predisposed, gradually cease as the constitution becomes accustomed to the agent. Like other poisons, by incessant and protracted use, it finally becomes comparatively inert. The system calls into requisition its powers of resistance, gradually adapts itself to the noxious substance, and finally tolerates it with little injury. In very minute doses, it may be breathed without any appreciable effects. All the virulent poisons, such as arsenic, prussic acid, nux-vomica, bohun upas, opium, etc., may be used in small quantities with safety ; yet who would think of employing them except for urgent sickness? Who would be mad enough to swallow them on the supposition of his *possible* illness, when he has every symptom of health? And who would be willing to inhale the noxious fumes of the chlorides because some visionary has idly conjectured that the air may be impure, when it has every appearance of purity, and when at the same time the fact is assumed—not proved—that chlorine has an universal power over atmospheric contaminations?

Of the effect of chlorine in destroying some of the fetid gases, I am well aware. It does this (generally at least) by its powerful affinity for one of the elements (hydrogen) in the composition of those gases, detaching it, entering into combination with it, and destroying the compound. This is a common effect of chlorine. But there *are* offensive gases upon which it has no effect ; at least, when used in such small quantities as not to render the air which contains it irrespirable. The truth of this remark I have often proved in dissecting rooms. In such places the “purifier” has often failed to remove stench, even when the apartment was strongly impregnated with it, as evidenced by the senses and the appropriate tests. A similar failure has often happened when a strong solution has been applied to decomposing animal matter. Sores and ulcers giving forth an offensive effluvia have not been uniformly deprived of their fetor by its application. Similar results have been witnessed by others. Chlorine,

then, is no more of a specific for stench than Swain's panacea is for indigestion. This is readily accounted for. Fetid gases are not necessarily compounds of hydrogen; and those that are so may retain this element by a strength of affinity which is too powerful for chlorine to overcome. Such gases or substances are often, probably, of a specific nature—peculiar proximate principles formed by peculiar chemical agencies. When such is the fact, "the universal purifier" is little better than burning tar or feathers. While chlorine, then, is an agent of considerable power in destroying bad smells, entering chemically into combination with one or more of the elements which compose them, it is not a *specific*.

It is believed that the knowledge of the power of chlorine over offensive odors first suggested its use as a "disinfectant." At the time of this suggestion, the shades of alchemy were not entirely dispelled. Men occasionally dreamed about "the philosopher's stone," and "the elixir of life." Chemistry was thought to have an importance among the sciences which it does not possess. Not only inorganic matter, but organic beings, were supposed under the dominion of its laws. The animal fluids were considered definite chemical compounds, which it was not beyond the powers of the laboratory to simulate. The matter of contagion was considered a gas not unlike what "chemists are accustomed to catch in their receivers," and the cause of epidemic and malarious diseases a similar gas floating in the atmosphere. The foul air which commonly surrounds the beds of the sick was identified with these aerial poisons, and it became an object to correct it. The "purifier" (chlorine) was applied. If odor could be removed, or drowned and rendered imperceptible by a more powerful stench, all was considered safe. This is the way in which the "preventive" came into use. The chemist, instead of *trying* his *infallible* and collecting *facts* in proof of its efficacy, sat quietly speculating in his closet. If his dogmas were doubted, he refuted the sceptics by an appeal to experiments made in his laboratory. This is the kind of *science* which has made so much noise in this matter.

There is a great error prevalent—particularly among those of little medical reading—respecting the agency in disease of *those gases perceptible by the senses* which are evolved from decomposing organic matter. Though I cannot persuade myself that they are entirely harmless, yet abundant observation has conclusively proved that they act a very subordinate part in the production of disease. There is the best reason to believe that the deleterious principle which is evolved from filth—from vegetable and animal matters in a state of decomposition—does not reside in those effluvia which are most obnoxious to the sense of smell; but in something else which is tasteless, inodorous, and often too subtle for the tests of chemistry to detect. There are numerous facts which show the inadequacy of the fetid gases alone to produce serious derangements of the health, much more endemic or epidemic diseases. The stench of slaughter-houses, barn-yards, privies, dissecting rooms, masses of putrifying animal matter, etc., particularly where there is free ventilation, although so concentrated as to produce occasional nausea and vomiting in those unaccustomed to it, and so abundant and diffusible as to impregnate the air for a furlong around, has been satisfactorily shown to have often no effect upon the health of those who are constantly exposed to it. Upon the seashore of New England, the farmers make much use of fish as a manure, leaving them to putrify and dissolve upon the soil. A powerful and most offensive odor is evolved, which is conveyed on the winds to the distance of miles, sickening the stomachs of passers-by; and yet no ill effects are experienced by those who turn up and till the ground. The facts of this description are so common that many physicians have contended that *animal* putrefaction is never productive of sickness. If fetid exhalations were of themselves sufficient to occasion permanent disease, or were indicative of an atmosphere *necessarily* unwholesome, surely no such facts ought to exist.

Again, intermittents, bilious fever and yellow fever, which are generally admitted to be produced by the effluvia of animal and vegetable relics (particularly the latter) in a state of

decomposition, frequently prevail to a most alarming extent, and with singular fatality, when the senses recognize no contamination of the air, and when of course no *fetid* gases exist. We come to the conclusion, then, which has often been arrived at, that *fetor* merely has little to do with sickness or health—that decomposing organic matter often evolves a most deadly poison which has neither smell nor taste—that the removal of nauseous odors in using the means of cleanliness is a matter of secondary importance—and that the employment of chlorine, as one of these means, which has no ascertained power over anything but stench, and only a limited power over this, is of little real service.

But suppose the fetid gases are deleterious to health ; and suppose that chlorine, under favorable circumstances, will destroy them ; is it easy to regulate the quantity of the latter necessary to decompose the former, and have none in excess ? Is it not always required that the chlorine should be greatly in excess in order to effect this decomposition with any certainty ? And is not this *free* chlorine productive of altogether greater and more certain injury than could possibly have resulted from the effluvia it was designed to destroy ? But on the supposition that the “ disinfecting agent ” can be employed in the precise quantity required to decompose an offensive gas, and does actually decompose it, what is the result ? A substance is formed, consisting of chlorine and the hydrogen which it has detached from the offensive compound. This is muriatic acid gas. It is acrid, irritating and irrespirable ; as poisonous as chlorine, and far more destructive to life than the fetid gases for which it is a substitute. A bad smell is indeed exchanged for one more tolerable ; but at the same time, an agent decidedly noxious is added to the atmosphere in the place of one which was hardly injurious.

In the preceding remarks on the employment of chlorine, I have considered it as mingled with the air we breathe—the way in which it is ordinarily recommended and used. But there is another mode of employing it. The apartment to be purified may be vacated, a vessel containing the materials for evolving

the gas placed within it, and the doors and windows closed. The room is thus soon filled with the chlorine. After a few hours, it may be opened and thoroughly ventilated. If everything which is capable of contaminating the air has been previously removed, the apartment will now perhaps be found sweet and wholesome. But chlorine gas is not the only one which will do the same. Any of those which have energetic decomposing powers will accomplish as much. The nitrous acid gas has often been effectually used for this purpose. Indeed, the free use of soap and water alone, aided by a plenty of pure air, never fails to answer a similar end. While the effects of the latter are equally or more certain, they cannot always be used without endangering the health.

Of the power of chlorine over the principle of contagion or infection, so roundly asserted by some modern alchemists, there is not a particle of evidence. True, indeed, if you could catch this principle in the bowl of a spoon, and pour upon it a concentrated solution of chlorine, there is little doubt you would destroy its activity. You might do the same with nitric, or muriatic, or sulphuric acid, or any other powerful chemical agent. The virus of smallpox or cowpox may be readily destroyed in this way. The mode in which this is done may be easily conceived, by observing the action of oil of vitriol or lunar-caustic upon the surface of a fresh wound on the body. A complicated chemical change is effected, the nature of which is not exactly understood. But I am not considering the influence of chemical agents on the contagious virus enclosed in vessels, but when diffused in the atmosphere. *When in this state*, if the "disinfectant" in quantities not irresistible can destroy it, those who assert that it can, ought to prove it. This has not been and cannot be done.

On a question of the kind under consideration (the "disinfecting" power of chlorine), the burthen of proof devolves upon the advocates of the chlorides. Until they have collected an adequate number of *facts* (not inferences) in support of their case, their statements are deserving of little credit. But where are these facts? The subject has been long before the public.

The claims of chlorine have been asserted and reasserted. It has been employed for a length of time and on an extensive scale in epidemic, endemic, and contagious diseases ; and what is the result ? It has been used in cholera wherever this disease has appeared—in Russia, Germany, France, England, Canada, and the United States ; and what that is new have its advocates to say in its favor ? Were its powers such as they have been maintained to be, would not this matter long ago have been put to rest, and the voice of cavilers and sceptics silenced ? No new evidence seems to have been gathered upon the subject. Nine-tenths of the medical world still go on doubting, while chemists still continue their scientific reveries, publishing to the world their closet speculations, and anon repeating the stale story about “the cathedral of Dijon.” When the cholera commenced its ravages in Albany, high hopes were entertained of arresting its progress by the chlorides. All took good care to lay in a supply of “the preventive.” Everything inside and out was deluged with the “disinfecting” gas. One’s chance of safety seemed to be considered directly as the quantity of chlorides he had with and about him. What followed ? The disease increased, as it had been wont to do in other places. Men sickened and died. Some fell victims with “the immortal catholicon” in their pockets ! People lost confidence in their protector. It went out of fashion and was abandoned, and presently the pestilence took wings. While the epidemic was among us, I watched closely and incessantly the effect of the means which were used as preventives. Burning tar, the fumes of sulphur, and the exhalations from the chlorides, were all fairly beaten. The latter seemed nothing better than the others ; that is, it was of no service at all. I have diligently searched, and have not been able to collect a single unequivocal fact to show that its use has with us been attended with the least benefit. Nor have I met with one who has been more fortunate than myself. Many who were its advocates in the beginning, were faithless towards the close. Most of the physicians here are now either indifferent or entirely sceptical as regards the “disinfecter.”

But has chlorine had no positive injurious effects in the profusion in which it has been used as a *cholera preventive*? Is it easy to conceive that the inhalation of so noxious and powerful an agent can be a matter of indifference, especially when the system is in a state of lively susceptibility to the action of causes disturbing the health? Where cholera prevails, there is an universal predisposition to disease—a predisposition which is kindled into a fatal blaze by the application of a spark. An injurious impression made upon the body, whether through the medium of the stomach or lungs, which in other circumstances would be productive of little harm, will *in this state* be followed by sickness and death. Is it safe, then, to recommend the general breathing of chlorine where this epidemic is raging? Is it not eminently hazardous? Would not this measure, if adopted, instead of preventing the disease, add to the exciting causes of an attack?

But what are the *facts* upon this subject? Enough have occurred in this city to satisfy any candid mind that the gas exhaled from the chlorides is *not innoxious*—that it cannot be respired with impunity where epidemic cholera is prevailing—that its tendency is to augment and not to diminish the number of the sick. It has taken rank here among the numerous exciting causes of disease, and has not been least in importance. I have experienced inconvenience from it myself, in common with many others. The effects on susceptible persons have often been powerful. On such, a state approaching asphyxia has sometimes been produced while walking the streets. An attack of the epidemic has in more than one instance been satisfactorily traced to the free respiration of chlorine. One physician has mentioned to me a remarkable instance. All the members of a large and respectable family were seized with the symptoms of the malady within eighteen hours after a liberal use of the “preventive” in all parts of their dwelling. Their physician not unreasonably attributed their sickness to the said “preventive.” I could mention other instances hardly less melancholy. I learn from a private letter, from a respectable source, that effects of a similar description were witnessed in

Paris, during their late epidemic, on a much larger scale. Chlorine, then, is about as much of a cholera preventive as ardent spirits.

But there is an *indirect* injury which is liable to result from the recommendation and use of the chlorides, which has not yet been alluded to, and which is of no slight magnitude. If the people are made to understand that these substances are adequate to the purposes of cleanliness, they will resort to them on the score of economy, to the neglect of more effectual and expensive means. We might argue this from the known mental constitution of man. This was argued and the consequences predicted. What was feared has taken place. Cleanliness with us has been neglected. Faith in the "disinfectants" has been one cause of the neglect. Filth, instead of being removed, has been too often merely sprinkled or mixed with the chlorides. This has not only been done *about* dwellings, but *within* them. I have seen the floors, furniture, etc., literally *plastered* with a mixture of filth and "preventives." *Removal* has too frequently been neglected, even when practicable, in consequence of its being thought unnecessary. It is laborious and expensive, and was so considered. Besides, it is an *antiquated* mode of making clean, and, moreover, is highly *unscientific*. *The new and improved plan* was enthusiastically adopted. Matters were conducted on *chemical principles*. Common sense was scouted, and her place occupied by a nobler genius—the genius of philosophy. The old and vulgar means of purifying, such as washing, and scouring with soap and water, ventilation, sweeping, scraping and removing, etc., were frequently abandoned, not only as costly, but *as behind the improvements of the age*.

Considerable authority has been quoted on the question under examination, which would seem to controvert the opinions and arguments which have been advanced. Though *authority*, unsupported by facts and reasoning, passes for little with me, it may do with some. By the way, if a question relating to the "disinfecting" power of a substance is to be determined by the numbers of those who assert it—those who give their opinions and then vouch for their truth—chlorine is

not entitled to our *exclusive* confidence. The nitrous acid gas was once brought forward with extravagant pretensions as a purifier and antidote to contagious and miasmatic emanations ; and if its efficacy is to be judged of by the numbers and respectability of those who attest it, it is far better deserving of consideration and respect than the *modern specific* : and yet, the nitrous acid gas is now little thought of by the *scientific* world. This is because its *modus operandi* in destroying morbid miasms cannot be explained by *chemical laws* ! [See Medico-Chirurgical Review, Vol. X, page 355.] For the benefit of those whose minds are swayed by authority and names, I shall make a few extracts—all which my limited space will allow—chiefly from *medical* writings, for the purpose of showing the sense of the profession on the powers of the chlorides as “disinfecting agents.” And here may I take the liberty to say, that *physicians* [all M.D.’s are not physicians], from their opportunity for observation, their intimate knowledge of *facts* and all their bearings, and their acquaintance with the correct mode of reasoning on medical subjects, are best capable of passing a correct judgment on a question like that under consideration. Those who have appeared as the advocates for chlorine has been almost to a man *chemists*, who have no *practical* knowledge of the subject which they have handled. Their *facts* have been gathered in the laboratory. Their conclusions have been the fruit of study. Their philosophy has been the result of speculation. How much, then, are their assertions and opinions worth ?

Dr. Caldwell, of Kentucky, a gentleman of general science and of great eminence in his profession, uses strong language upon this subject.

“Combustion excepted, I repeat, that thorough washing and ventilation are the only certain means discovered to purify foul and sickly ships, and render them the abodes of cleanliness and health. Of hospitals and infirmaries the same is true.

“It is not only useless, then, it is injurious, to fill the wards of receptacles of the sick with suffocating and irritating fumes and gases, to the annoyance and distress of patients with

tender eyes and weak lungs. I have never seen a place thus fumigated, without exciting among the sick painful coughing and other disagreeable affections. And if disinfection seemed to be the result of the process, it was owing to the other means used at the same time, and not to fumigation.

"Shall I be told, in objection to my opinion on this subject, that chlorine gas and some others destroy the fetid exhalations emitted by putrid animal matter, and in that way contribute to purity? The fact is known to me; but it is also known, that such exhalation is not the febrile miasm of which I am treating. That poison exists in its most virulent and destructive condition unaccompanied by any odor. It does not follow, therefore, that because chlorine gas destroys the fetor arising from the dissolution of animal or vegetable substances, it will also destroy the poison. This loose substitute for reasoning is an abundant source of error and mischief. Nothing but an accurate and successful experiment is competent to prove that any known gas is capable of uniting with febrile malaria, and neutralizing it. And as far as I have been informed myself, such an experiment has never yet been made. Hence the belief in the (anti) miasmatic properties of the gases referred to is nothing but hypothesis."—[American Journal of Medical Sciences for August, 1831.]

Dr. Drake, of Cincinnati, a physician of great celebrity, uses the following language:

"Not the least reliance is to be placed on lime and its chlorides as *direct* preventives of epidemic cholera; and no great confidence ought to be reposed in their power over nuisances. It is better to remove putrescent matters than to correct their stench with lime, or even the boasted chloride. Moreover, an independent use of the last may and often has proved injurious to health; the chlorine gas which is liberated being, if breathed undiluted with atmospheric air, a more deadly poison than that which produces cholera."—[Treatise on Epidemic Cholera, July, 1832.]

Dr. Tully, of New Haven, whose standing as a professional man and as a chemical philosopher entitles his opinions to great weight, in a private letter, dated August, 1832, says:

“I concur with you most fully in regard to the supposed efficacy of the chloroxids of calcium and sodium (in other words the chlorides), and even chlorine itself, either for the destruction of specific contagious, morbidic miasmata, or epidemic causes, whatever they may be. I have come to this conclusion because I have not seen even a particle of evidence in favor of what is called their *disinfecting* powers. I do not know, however, that, on a subject of this nature, a negative can be proved. The *onus probandi* must rest on those in the affirmative. Now where are the proofs? If there are any, would they not long before this have been adduced? That the chloroxids, and especially the chlorine itself, will frequently destroy offensive smells or odors, I do not pretend to question; but they certainly do not do this universally. I have myself often known them fail.

“It is well known by physicians that those effluvia which are most manifest to the senses possess but little if any power in the production of disease; while those which are most noxious have no sensible properties. The contagion of smallpox and measles, and the power or influence by which jail fever is produced, cannot be recognized by the senses.

“I have long been satisfied, that washing with soap and water, and ventilation, are the only adequate means of purification and, I will add, *disinfection* (as the fashionable and cant phrase of the day is).

“In addition, it appears to me that the chlorides, when freely used, may do injury. They may prove exciting causes of disease, when the predisposition is strong, like other noxious exhalations.”

Dr. Yates, of New York, makes some very sensible remarks on this subject:

“The power of ‘disinfecting agents,’ except on stench and putridity, I deem extremely problematical. We want proof that the atmosphere is less pure now than at other seasons. We want proof—only *probable* proof that the air contains a particle of infecting matter,” etc.

“But allowing that imperceptible particles of infectious matter exist in the atmosphere, what proof have we that the chlorides will alter their nature or their properties? Only from this analogical deduction, that inasmuch as chloride destroys the stench of putridity, it must of consequence destroy the substance matter of infection—an unphilosophical deduction at best. But let us come to a case in point. Will chloride destroy the poisonous quality of arsenic, the emetic property of antimony, or the soporific effect of opium? If not, what right have we to suppose it will otherwise effect an imaginary particle of poisonous matter floating in the atmosphere? We *cannot* know, from anything that has yet been discovered, that chlorides have the slightest chemical influence on the quality of *any* matter except its odor, much less on that of the matter in question. Hence, I conclude that all the expense incurred in their distribution throughout our streets and yards, is a mere boon to public alarm and prejudice.”—[Yates on Asiatic or Spasmodic Cholera, August, 1832.]

I shall now make an extract from a letter from Dr. Parsons, of Providence, to a gentleman in Boston. The letter was designed to show the inefficacy of the “disinfectants.”

“The sloop *Hero* sailed from New York on the 17th of July (1832), with thirty passengers on board, and was quarantined at Newport eight days from her time of leaving that city. On the day of landing the passengers, four of them were immediately attacked with Asiatic cholera, and died in a few hours. *This vessel had five tons of best Scotch chloride of lime on board, shipped on the 14th of said month; any one cask of which, the owner informs me, would give out through the staves sufficient gas to saturate the atmosphere of the vessel as effectually as would be done if the floors and decks were sprinkled with the powder. Yet with thirty such caskets between her decks, this happens to be the only vessel out of the great number arriving with passengers from New York, that has brought any person infected with the disease.*”

This statement, I think, must prove of difficult digestion to the advocates of “*preventives*.” It contains an argument which

may serve any purpose but theirs. It seems to prove that chlorine is not *the specific*, after all—that *science* is not always triumphant. It reveals a *fact* which may be justly regarded as an outrage on *rational chemistry*.

Albany, September 6, 1832."

[LETTER SIX.]

Albany, July 12th, 1832.

DEAR SIR—The epidemic cholera has appeared among us within the last few days. The first cases we had of it were on the morning of the 3d instant. At that time, two persons of intemperate habits were taken down with the disease in its worst form, which proved fatal, in each instance, within the course of a few hours. On the 4th, there was another case, and on the 5th two others. All these were of a very decided character. They occurred in distant and unconnected parts of the city, and had no intercourse with each other. They are universally believed to have been of indigenous origin. Every effort to trace them to contagion has entirely failed.

Though I am willing to admit all the *facts* on the side of the anti-contagionists, I am still a decided advocate for the doctrine of *contingent contagion*, as maintained by J. Johnson and others of the present day. I am firmly of the opinion, that cholera may be contagious under *particular* circumstances. I am led to think so not only from what has been noticed here, but from what was witnessed on a much larger scale in Montreal and the other seats of cholera in the north. The truth seems to be this:—the disease is contagious (the terms contagion and infection are used as synonyms) in crowded, unventilated dwellings, amid filth, intemperance, and poverty, but rarely or never in cleanly, airy apartments, the inhabitants of which are regular and temperate, well fed, and well clothed. Let a cholera patient be thrown into a tenement of the former

description, and one-half of the wretches about him will be almost sure to sicken within the space of three days ; while a habitation at a distance, under precisely the same circumstances, as it regards its location and internal economy, and the habits of those who live in it, will perhaps for the present escape. Numerous instances might be referred to, exactly in point. The manner in which the conclusion derived from them is commonly evaded, is extremely disingenuous, and would be instantly scouted at in any other branch of physical science.

Some weeks before the appearance of cholera among us, there was almost an entire suspension of all other diseases. The state of things resembled the calm that precedes the storm. It was evident that the epidemic constitution was about changing. The complaints that were noticed were strangely anomalous and irregular. They often blended, and produced hybrids, or a more compound disease. Influenza, measles, whooping cough, and scarlet fever (the three former of which were very rife and severe here during the winter), frequently seemed to unite in the same person, producing a disease of such an equivocal character, that it was difficult to tell which element in its composition preponderated. Sometimes a number of cases would occur in a single family, in immediate succession—one of which, had it been an isolated case, would have been called measles ; another, scarlet fever ; and another, perhaps, influenza, or a kind of sub-pneumonia, &c. Intermittents (which were common) put on an unusual appearance ; they were complicated, irregular, marked. At last, about three or four weeks before the cholera appeared, complaints began to assume a diarrhœal form, showing distinctly the commencement of a new epidemic constitution. As these became more frequent, and more marked in their character, other diseases gradually disappeared, until they were all lost in the prevailing disorder. They were at this time easily managed, and very rarely assumed a serious aspect. They affected the public health so triflingly, that it was considered a time of unusual freedom from sickness. Physicians had little or nothing to do. The

smallness of the number of deaths in our city was almost unexampled.

The commingling of diseases above referred to, producing anomalies of almost every description, as if opposite and contending forces had met, and each struggled for the mastery, was observed during the first part of the present year, in the places which I visited at the north, where cholera has prevailed. Bowel complaints, too, were the immediate precursors of the epidemic, showing, first, the preponderance, and in a short time the complete formation of the present constitution. Notwithstanding these intestinal disorders, it was a time of general freedom from sickness requiring professional attendance. This fact was so extraordinary in some places, as to excite the surprise of medical men. In St. Johns, where cholera raged to a considerable extent, the like had never before been witnessed.

Very respectfully yours,

HENRY BRONSON.

With his strong individuality, and his great force of character, and with his exceptionally high qualifications for maintaining an independent professional standing, it would only have been natural if he had soon tired of the secondary position he was then occupying.

However that may have been, it was not long after his return from Canada, and making his final report to the honorable committee that had sent him abroad, before we find him, at the urgent solicitations of his father, and of the leading citizens of his native town, returned to Waterbury. Here he easily held the

foremost rank as a medical man of rare attainments, as he doubtless would have done anywhere, and began at once a country practice, large from the first, which rapidly became extended over a very wide field, and soon was counted as by far the largest in Connecticut, and probably in New England.

During the closing days of that year, 1832, Dr. Bronson was waited upon by a commission of medical gentlemen from Philadelphia, offering to him the flattering proposal to become president of the leading medical college there. The proposition was entertained and discussed. But after a conference of the most free and confidential nature, it was mutually concluded that the only apparent obstacle to his prompt acceptance of the invitation was his youth. He had only then completed his 28th year.

In the beginning of the year 1833, we find our young friend engrossed with the arduous labors of a country doctor, ambitious to perform to the fullest extent every duty that could properly be required of him. His long rides on horseback, over the hill country of northern and western Connecticut, and over the line into Massachusetts, and up and down the Housatonic Valley, in the intense heats of summer, and the severity of the winter's cold, were at first invigorating to his constitutional health.

But, after a few years of such hard and unremitting discipline, to which were added the peculiar anxieties and wearisome details common to such a life, his health began to show signs of failure ; and it was with reason feared by his friends and by himself that, like his two brothers, one of whom was a physician, he was in great danger of falling a victim to that fell disease which annually has claimed as its own, the most promising youth of New England. And we feel obliged to add to the influence of his incessant labors, and constant exposures to great extremes of temperature, the general impairment of his health and the weakening of the powers of resistance against disease, caused by his experiences at Montreal, from which probably he never entirely recovered.

In the autumn of 1839, it became evident to himself and his friends that he would be compelled temporarily to relinquish his practice, and seek recuperation in a milder climate. He left New York in November, by a small sailing vessel, bound for the Mediterranean, and after a long and uncomfortable voyage was landed in Genoa, very much improved in health. Spending the most trying months of the winter in Rome and Naples—visiting more than once such places of interest as Pompeii and Herculaneum, he made the ascent of Vesuvius, going up to the very rim of the crater. His daily journal, kept for the

pleasure of his family, is exceedingly full and interesting in its connected record of the usual series of incidental experiences met with by tourists, and indicates that he left behind him in Italy nothing unvisited worthy of recorded notice. Taking passage by steamer at Civita Vecchia, he visited and critically explored Marseilles and Lyons, and passing slowly by diligence across France to Paris, he found himself in more congenial surroundings. Here he began again his pedestrian excursions, visiting and describing all the most noted churches, monuments and localities in Paris, especially those of historic interest. He visited here, as afterward in London, the hospitals and medical colleges and heard lecture some of the most celebrated medical men in each of these capital cities—visiting also libraries, museums and picture galleries, and theaters—and his journal records most intelligent judgments of their relative value and importance.

As an illustration of the chaotic state of the so-called medical sciences in the last century, and even later, I may venture to say, without presuming to speak with critical exactness, that the majority of medical practitioners upon our continent, in every period up to the early years of the present century, have been incapable, through the absence of education, of reasoning closely and logically as to the causes

and phenomena of disease; while the entire population were in accord with the doctors, and preferred to believe with them that diseases could be cured only by blood-letting—and by administering to the sick powerful and vile combinations of vegetable and mineral poisons, designed to shake to its very centre, as they did, every organ of the body.

Within five or six years, I have seen an elaborately written prescription of this sort, a recent production, directing the combination of twelve active remedies, reaching almost a cubit measure in length—but of the extent of its range and of its destructive force no report has ever been made.

These were the golden days of faith in drugs, when poly-pharmacy was in the extreme of fashion, and the dispensing of medicines was a most profitable vocation. Most men in those early days were too illiterate, and unable to escape from the grinding pressure of the laws of necessity long enough to acquire a scientific education; and those supposed to be capable of imparting such knowledge were few, and being mostly in the largest cities, they were inaccessible, and had themselves become only partially emancipated from the thralldom of false science, upon which no processes of correct reasoning could be based; so that we cannot wonder, if men, ignorant of the great facts of human and comparative anatomy and physi-

ology, established by the Almighty, were for many generations unable to comprehend that other and greater fact, that under the unobstructed operations of the laws of nature, his creatures should be enabled, in most cases, to throw off the diseases of which they had become the victims, through their ignorance of those laws.

Nor is it surprising if in those early days of darkness, which have not yet entirely disappeared, the majority of medical men could not be convinced that a very large proportion of diseases, for the cure of which they were daily prescribing a multitude of very active and disturbing drugs, were in point of fact *self-limited*—and would, under the operation of natural laws disappear of themselves, if the doctors were not in the way.

Neither were the people prepared to receive or to tolerate such a doctrine; and I am sorry to add that, even in the present generation, such is the degree of popular apathy or want of information that, comparatively, only a few among the most enlightened people anywhere, are able to appreciate the vast difference there is between being cured and getting well.

Arriving at his home early in the spring of 1840, Dr. Bronson reported himself to be in excellent health, and almost immediately resumed his daily routine of professional work.

With his remarkable powers of mind strengthened and heightened by his intimate acquaintance with books, and enriched by the experiences of foreign travel, and with a professional judgment matured in that best of all schools, ten years of country practice, supplemented by clinical study in European hospitals, and at the bedside, we can understand how eminently qualified he now was to assume the responsibilities of a public teacher of medicine.

As soon as he was fitted to fulfill these duties, the place awaited his acceptance ; and in 1842 his election as professor of *Materia Medica* and *Therapeutics* in the faculty of his *Alma Mater* was hailed with great satisfaction by the medical profession in this and the adjoining states. His acceptance of the election, however, rendered it necessary for him to remove his residence to this city, where he made no efforts to gain patients, but devoted himself wholly to his college work, for ten years consecutively, when he resigned his professorship. Responding to repeated calls to resume his college duties, from time to time he continued to instruct his classes until 1860, when his health again failing him, he spent the winter of 1859-60 in Barbadoes.

As a public teacher of medicine, Dr. Bronson was eminently successful in the work of interesting young men, and aiding them to acquire as full

knowledge of the dry details of his department of *Materia Medica* and *Therapeutics* as they were able to retain. His lectures were mostly written, and were read slowly in a clear, distinct voice, and an impressive, deliberate manner, and they were listened to with close attention. He also gave to his classes occasional lectures upon topics outside of his regular courses. They were almost unequaled in interest and instruction, particularly if he chose for his topic some one of the great fundamental principles of medical science. He was then at his best, and showed the highest qualities of a great teacher; he needed the stimulus of a great subject to bring out the full exercise of his powers. Many men, however, have excelled him as a teacher of the elementary facts of science, but as a writer upon medical philosophy he was very attractive. The society is familiar with the admirable and forcible style of his writing, in the many papers he has read before it.

Dr. Bronson inherited many of the strong points of his intellectual character from his father; and so generally was this fact recognized by those among whom each of these remarkable men was well known, that it has often been said that a sketch that would do justice to the father would be recognized as amply sufficient for the son. But, in this estimate of the mental qualities of our friend, those who knew him

well are unwilling to concur. While it was undoubtedly true that in the natural elements of his character, as well as in the structure of his moral and intellectual faculties, he greatly resembled his father, having similar tastes, and upon many questions arriving at similar conclusions from the same points of view, and in some instances drawing the same conclusions by the same course of instantaneous or intuitive logical deduction, and to a degree cherishing the same excellent opinions of his own infallibility of judgment, to which he had much better reason than most men to lay claim ; certain it is, that his powers of perception and analysis were more subtle and acute, and he possessed in a greater degree those mental traits, and that spirit of devotion to a definite purpose and end which enabled him to pursue successfully the lines of historic inquiry marked out by his father, affecting more or less closely large numbers of families, comprising one of the wealthiest of the wide-spreading industrial centres of our state. He was by nature a historian ; and any one led by motives of curiosity or of personal interest to examine critically the recorded history of Waterbury will, I think, be surprised by the evidences of the laborious personal investigations to ascertain necessary facts, and so far as was possible by persistent efforts to gather them personally, and from the original records.

To say nothing of the gathering of historical facts, the labor of acquiring the traditions of a country side through half a dozen populous manufacturing towns, and the preparation for the press of the biographical sketches of a large number of business men, was great and exhausting when added to the already heavy burdens of a busy physician. The history of Waterbury forms a compact volume of 600 pages, with thirty portraits and many local views, engraved on steel, and was in itself not a small undertaking for one who could devote to it his entire time; but when we consider the very extended research required to trace out the natives of Waterbury who had removed to other States, we can form perhaps a just estimate of the relative magnitude of the labor expended upon even so small a work, carried on as it was under the pressure of public duties, as well as of professional and other literary labor.

That this arduous work was continued under very discouraging circumstances, while it daily grew upon his hands, was evident to those near enough to observe; and they could but admire and wonder at the courage and perseverance with which, under so many difficulties, he completed his self-imposed task.

I have been familiar with a considerable number of histories of towns and counties in New England, but I know of none with the same limited scope that are more valuable than this. Indeed, I may say without

fear of contradiction, that the beneficent influences upon a New England community, of such a chronicle of the facts and opinions that were coincident with the laying of the foundations of society, and which in future generations shall mark in its successive editions the changes of an advancing civilization, cannot be over-estimated.

Not by any means the least important of the historical work accomplished by Dr. Bronson, was the interesting series of historical and biographical papers pertaining to the medical history of New Haven County, and read before this society between December, 1872, and October, 1876, comprising 150 pages of Vol. 2—including the professional histories of eight members of the New Haven Medical Association. He says in a prefatory statement, that in the following papers "I have aimed to put in an enduring form much valuable and often perishable material gathered several years ago from many sources—records, manuscripts, documents and letters, old newspapers, traditions, and living witnesses.

In their preparation I hoped to make an acceptable contribution to general history, and at the same time render a special and much needed service to the medical profession.

Before the Revolution there was not much intercourse between the different sections of our country.

A limited coasting trade along the Atlantic border brought the commercial classes in the maritime towns into frequent contact; but the benefits of this intercourse scarcely extended to the interior.

Each colony—in many instances each town—was to a large extent an isolated community. But the war, which broke out in 1775, brought with it great changes. It excited the wildest passions; introduced selfishness, corruption, vice, misery,” and what in his estimation was the worst of all the consequences of war, “*a deluge of paper money*. But,” he adds, “certain advantages flowed from it.”

The medical profession of the State highly appreciated the medical histories of Connecticut, as prepared for us by Dr. Bronson, in the very valuable and interesting biographical notices of prominent physicians in our early days, and read from time to time before this society, as well as other papers on the same general subject, printed in the Proceedings of the Connecticut Medical Society. They still continue to be read as classics by all the medical men of the State, whose tastes incline them to preserve the historical literature of their profession; but unfortunately, owing to the very limited edition that was published, these papers, being out of print, are no longer generally obtainable.

Speaking further of the "days of the Revolution" and the formative stages of the medical profession in those turbulent times, he says, "Large bodies of men were gathered from every quarter and associated for military purposes; and to supply them with food and clothing, arms and equipments, an extended internal trade was required. The sections near and remote were for the first time brought face to face, and bound together in desperate endeavor for a common object. Men who had before been strangers became co-workers and personal friends. Though the standard of morality was debased, they learned well the advantages of union, of combined effort, and social intercourse which they were slow to forget. The accomplishments which individuals in high positions possessed became by contact and the magnetism of superior natures common property, and reproduced their like. Emulation was excited and society enlightened, and in a certain sense improved and refined.

There were in the army a few accomplished and many respectable physicians and surgeons who witnessed and shared the benefits of united effort—of familiar professional intercourse—and who, when peace returned, feared the disintegration and depressing influences of isolation. It was to prevent this disastrous result to a fine body of medical men, who had largely contributed to the success of the colonial

armies in the field, and the independence of these United States among the nations of the world, that our army surgeons resolved themselves into county and State organizations to promote professional excellence, as well as to maintain, for the benefit of the whole country, the nucleus of what they saw was to become one of the learned and most useful professions upon our continent."

As a writer upon finance and political economy, Dr. Bronson's opinions have always been received with great respect wherever they have become known. He was an advocate of hard money. His father also was a local authority on financial questions, and established the first bank in Waterbury, of which he was always the president during his life; and many of the Bronson name, in this and other States, have acquired renown as financiers, or as editors of financial journals and leading newspapers outside of New England.

Dr. Bronson has read before this society several papers upon financial topics, which have been published in its archives, and have attracted wide attention,—and I have high authority for saying that these papers, or any one of them, would be sufficient to establish a brilliant reputation for any writer upon financial questions.

I need not remind the society that in 1863 he read before this body, at convenient intervals, a very remarkable series of papers, having for its title as a completed publication, "*A Historical Account of Connecticut Currency, Continental Money, and the Finances of the Revolution*," pp. 192—forming about one-half of the first volume of the society's transactions.

Ten years afterward, he read before you a supplementary paper entitled, "*The Money Problem Again*,"—which was perhaps more easily understood by the popular mind, but the first series was of greater importance historically.

I had proposed to myself to insert here an abstract of certain pages from the "Money Problem," in which I was interested, but it occurs to me that while I am not competent to generalize profitably upon the subject, the members of the society are all familiar with Dr. Bronson's financial views as set forth so fully in the valuable papers he has from time to time presented here. A financial authority and a close student of political economy,* whose intimate relations with Dr. Bronson qualified him to form a valuable opinion, said of him :

* Mr. George A. Butler.

“He took a deep interest in the currency question during the whole period between the passage of the Legal-Tender Act and the resumption of specie payments. To him it was a practical question of the deepest import, affecting in the most serious manner the prosperity, welfare and happiness of the people of this country. He clearly foresaw the dreadful evils and disasters that must inevitably result from that legislation.

There was never any doubt in his mind, from the day that measure passed Congress until the final catastrophe, as to what the result of that legislation would be. He condemned it as an economic blunder of the greatest magnitude, but it was more than that to him; and as a patriot he felt and deplored the injury it was to be to our finances through the evils growing out of the war; and as a man he sympathized with those who lost their property by the insidious working of an irredeemable legal-tender paper money; and because most of them would never comprehend how their misfortunes came upon them.”

Favored as he was by fortune and the circumstances of his birth, surrounded by the happy results of wise and successful mechanical combinations, pushed to the utmost limits of artistic development by abundant capital and skill, we can see by what an easy grade he became wealthy without exertion.

Forming his views of finance in such a school, where every scrap of metal was made to yield up its equivalent of the gold basis that was in it, he could have come naturally to no other conviction than the one he so often expressed in respect to the financial conduct of our late war, to wit: that the war could have been as speedily and as successfully brought to a conclusion on a specie basis as it was on a basis of paper money—in either case the accumulation of an immense debt was the inevitable result. The opinions of wise men differed widely, however, on this question, and do still differ; but it is probable that the majority of our people favored the use of a greenback currency. Dr. Bronson attached himself to the Herbert Spencer school of political economists. They agree in their statements as to the shockingly deplorable condition in which are all existing things—church and state and social organizations. They leave us in no doubt as to what really *ought to be the actual condition of the entire population of the world*. But they give us no idea of what is a possible and practicable working plan, by means of which all peoples can be placed on the same elevated plane, in such relations as to secure to them universal happiness.

Just at this point we may, perhaps, be able to trace the beginning of a quality of his mind which, while

it was not accompanied by any of those absurd vagaries that are commonly supposed by the weak to indicate the adoption of infidel principles, and by which physicians are thought to be too easily influenced, there was in the constitution of his mind a notable absence of the element of faith as understood by the Christian world—that “faith which is the substance of things hoped for, the evidence of things not seen.” Supplying its place, perhaps, if that were possible, we find an absorbing reverence *for the law and the testimony*.

His first requirement was for the facts—the proofs—and from these he deduced the law. There was in his being no sentiment or shadow of irreligion. His soul was devout, and his whole life without reproach. He was honest, natural and simple-minded in all his ways. True in everything which a good conscience might approve, he abhorred and detested deceitful men, and shams of every sort. Familiar, by protracted and repeated systematic study, with history, theology and party politics, he had no affinities with the two last—considering them as resting upon changeable and insecure foundations, and as not essential to the highest welfare of mankind.

Dr. Bronson was always deeply and intelligently interested in securing for *all the people, free of cost*, the best common school education, by the best teach-

ers that could be procured—such an education as would best harmonize with the tastes, habits and mental needs of the majority of our people; and for them he was always a strenuous advocate of a *better* education, and of a much more practical kind than was commonly afforded anywhere. But he was also a decided opponent of the imaginative schemes of those dreamers, none too well-educated themselves, who desired to see all our common schools grouped around Yale College—and so conformed as to constitute the integral parts of a great University, interdependent upon each other—while the powerfully attractive force of the great central body, causing its satellites to revolve in regular orbits about it, would represent, in full operation, what has come now to be known in some circles as the “*University extension*” plan—by which incentives to acquire the elements of a liberal education—a mere smattering of universal knowledge—are held out to all as most desirable, irrespective of their needs, or of their *capacities* to *receive an education*.

The disappointing and unsatisfying fruits of this system, designed to offer to all our youth a free classical and scientific education, are to day painfully apparent; and our present system of free High School education has come to be deprecated by an increasing number of the best informed minds, as a *system of education that does not educate*—and as being in no

sense adapted to supply the vital needs of that large class whose lot in life will compel them to earn their support by manual labor, or its equivalent. For entertaining and defending these views he was violently assailed by anonymous but well known persons, whose unwillingness to endorse their crude notions by printing them over their true signatures can no longer be regarded with surprise. But he was sustained as to the intrinsic validity of his opinions by his abiding conviction, that whatever theories men may adopt concerning the development of the human intellect, any departures from the laws of mind, in the natural processes of its growth, can only result in irreparable injury and disappointment.

And now, the melancholy pleasure is allowed to those who labored by his side so many years ago in the interests of true education, to note on every hand expressions of useless regrets that his wise counsels were not permitted to prevail.

While Dr. Bronson's mental powers, both analytical and synthetical, were naturally of a high order, they were largely increased by the incessant demands made upon them; their growth, under the general law, being stimulated by those demands for work, and by the performance of it. With a retentive memory for facts, he possessed in marked degree what is known as the *scientific* mind,—and having been always

a student of the physical sciences, he was capable of justly considering, from almost any point of view, the physical problems that might be presented to it. The steady equipoise with which he firmly held for judgment the evenly balanced scales of argument, each at times perhaps more weighty than the other, indicated the highly *judicial* qualities of his mind—a mind fortified by a comprehensive knowledge of the principles of jurisprudence, as well as of statutory law. So that, if he had not been the great physician that he was, in the broadest sense of that term, it naturally follows that he would have chosen the legal profession, and would have become a great constitutional lawyer,—or one of the distinguished jurists of our land,—and could have worn with adequate dignity and grace the honors of its highest judicial position.

In view of his great natural endowments, and of his remarkable acquisitions in learning, such a prediction might safely have been foreshadowed in the masterful manner in which he used the English language, (and he was not ignorant of foreign tongues)—in the critical choice of words,—in the judgment and good taste shown in the formation of his sentences,—in the strategical skill with which his arguments were constructed and applied,—and lastly, in the convincing power of his rhetoric, and the accumulating force of his language, increased by the very

deliberate manner of his utterance,—all combining to compel, as it were, his auditors to adopt as their own the conclusions previously reached through the logical deductions of his own mind.

It is almost half a century since the day I was first made known to him, and I remember the occasion as one never to be forgotten ; for during all this long period of close and almost daily intercourse, there was never even the shadow of a cloud between us. It was a period of confiding and unbroken friendship which was to me most delightful and profitable.

Honest, natural and simple in his character and tastes,—sincere in every manifestation,—unreserved in all declarations of his opinions if he uttered them at all,—loyal to every known duty or obligation, his simple word could not be strengthened by his bond.

His business transactions were conducted with exactness of accounting, and upon a basis of strictest integrity ; while he would retain nothing that could be rightfully claimed by another.

Respected and admired by his own profession, he enjoyed in an unusual degree the public esteem and confidence.

Like other men of wealth who have suffered in the estimation of the public whom they did not take

into their confidence in the management of their affairs, and whose *right hand* has not been permitted to know what was done by his *left hand*—who preferred in other words to keep his private affairs from the public knowledge, Dr. Bronson was regarded by some who did not know him well as being parsimonious.

In my judgment of his character nothing could well be farther from the truth. He knew the value of money; he also knew the average qualities of men. Moreover, he was not ignorant of the injuries so often sustained by communities and individuals, through thoughtless benefactions for objects which were either not then needed, or which communities and individuals could well enough provide for themselves. With his *right hand* he gave to Yale College eighty-six thousand dollars toward founding a professorship of Comparative Anatomy and Physiology—to the New Haven Hospital he gave twenty thousand dollars, and to the Hospital at Waterbury he gave ten thousand dollars.

But with his *left hand* he privately distributed annually thousands of dollars among needy people more or less, or not at all related to him; and the continuance of these pensions and legacies remains a verbal charge upon his estate, and is voluntarily assumed by his heirs. Mortgages upon property of

other needy friends upon which he had for years paid the interest are no longer to be found. In other cases, permanent repairs to homesteads were ordered, no one knew by whom. And in still other directions the landscape has been made to blossom, under the beneficent guidance of his bounteous *left hand*, and many grateful hearts have been made glad.

* * * * *

In presenting to the public, and to such members of the medical profession as may see them, these sketches of Dr. Bronson, and his letters written at Montreal to the Albany Committee in 1832 upon the subject of the epidemic of Asiatic cholera then prevalent in Canada, it is deemed unnecessary to call attention to the great advances which have been made in every department of medical science since they were written—more than sixty years ago—particularly in bacteriology, which at that time had no existence, but also, and mainly, in pathology and therapeutics, with both of which branches of study Dr. Bronson was, during the years of his active life, constantly occupied.

Those also, who were by many years his juniors in the profession, may be interested to know that, although not a microscopist, he was an appreciative student of whatever has been published on bacteriology in late years, since 1849;—and slow going as

he always was, and admitting with reluctance whatever was doubtful, and requiring demonstrative proof whenever that was possible, he yet looked hopefully forward to microscopical research as offering possibly a future field of discovery as to the causes of several epidemic diseases, the most prominent of which were typhoid fever and Asiatic cholera.

During that and the years immediately following, the questions as to the origin and nature of these two diseases were very often discussed in our medical meetings; and there were not wanting those who fancied they saw a connection between them, and it was only by a process of exclusion that the question was finally narrowed down to the very indefinite and unsatisfactory conclusion that the causes of these two infectious and contagious diseases were in their nature tellural. It was during these discussions that I first heard of "fever germs of definite forms floating in the atmosphere."

For the better understanding of what I am about to mention, and as illustrative of some of the rarer qualities of his mental constitution, it may be said that, in the discussions of unsettled questions, particularly such as related to the medical sciences, it was always Dr. Bronson's preference to be for the time associated with some friend holding opinions in direct

opposition to his own—with some one for whose qualities of mind and heart he could entertain the highest respect and esteem. With such a contestant he delighted to study, even for many weeks, any questions of common interest.

Any presentation therefore of the historical relations of Dr. Bronson to the invasion of our hemisphere by Asiatic cholera in 1832, would be incomplete which did not include within its scope some notice of his intimate personal friend, and zealous colleague in after years, Charles Hooker—born 1799—Yale, 1820—M.D. 1823, and professor of Anatomy and Physiology from 1838 until his decease in 1863. Living for many years near each other in the same street, these men of congenial minds, but dissimilar tastes and habits of thought, became intimate and inseparable friends. With daily opportunities for the interchange of thoughts, they formed an element of great strength and commanding influence in our small professional community, while each of them enjoyed the affectionate personal regard of the entire body.

In the year 1865, Professor Bronson read before the Connecticut Medical Society, an exceedingly interesting sketch of his deceased friend Charles Hooker, from which I quote his language describing the experiences of the latter in the treatment of cholera in the epidemic of 1832, as most valuable and

instructive in themselves, and quite germane to the historical character of this paper ; but more especially because of the clear reflected light, which at this great distance of time they cast upon the modern germ theory of disease, as now enunciated and taught by the foremost bacteriologists of our time—but which, it may still be said, are held *subjudice* by many of the best educated medical men.

Since the death of Dr. Hooker, favorable opinions have been often and freely expressed, regarding the advanced views held by him as to the causation and a more philosophical treatment of a number of important diseases, then but imperfectly understood ; but strengthened as these views were by the logical reasoning of his friend Bronson, they became, and still remain the settled therapeutic theories of some of our best practitioners. In the course of his remarks, Dr. Bronson said of him : “ Though some physicians, as was to have been expected, were accustomed to smile at the persistency with which he urged his peculiar views and methods of treatment, they were very favorably received, and generally adopted, particularly by the younger members of the profession. His chosen remedies and favorite modes of management are now (1865) in common use in this section of the State. Perhaps his opinions modified the practice which prevails to-day, more than those of any man who has lately lived among us.”

In this cautiously expressed opinion, I am confident that most, if not all of the living contemporaries of Dr. Charles Hooker in that day, would have heartily concurred.

What is, however, of greater historical interest to us in this connection, is the relations which Hooker sustained to the first invasion of cholera among us, and his published report of its course and treatment in this city. Of these Dr. Bronson adds: "In the summer of 1832, that scourge of the East, the epidemic cholera, made its first appearance in New Haven. Doctor Hooker took a deep interest in the treatment of the new disease, and published an account of his experience (with it) in the Boston Medical and Surgical Journal for July 24th, 1833. The first twelve cases which came under his notice were treated with opium, calomel in frequent small doses, stimulants, irritants and external heat,—the common practice; six recovered and six died. The next twenty-one cases were managed in a different way. Calomel was given in large and frequent doses, commencing with twenty, forty or sixty grains. Subsequently, from eight to twenty grains were administered every hour, or at longer intervals, according to the severity of the symptoms.

At the same time, small and frequent doses of tincture of camphor and pieces of ice were ordered, and heat and irritants applied externally. But

calomel, (given in dry powder and followed by a teaspoonful of cold water,) was the sheet anchor. One patient took two hundred and sixteen grains in thirty-six hours with the best results. Of the twenty-one cases managed in this way nineteen recovered. The large doses of calomel, instead of producing a cathartic effect, allayed vomiting and purging, and completely suspended peristaltic action, as proved by the application of the ear to the abdomen.

If in six or eight hours intestinal motion was not resumed, mild laxatives were employed."

Before quoting further from Dr. Bronson's interesting biographical sketch of his friend Hooker, which deserves to have had a far wider circulation than it has yet met with among the profession of our own country, no apology need be offered for resuming here the history of the cholera epidemic of 1849, of which Dr. Bronson was personally cognizant.

Speaking now, however, from my own limited experience as one of the younger physicians, I may state that the sickness of that year which occupied their attention very early in the spring, and was almost universally prevalent, was an unmanageable form of dysentery, attended from the first with marked typhoid symptoms, rapidly proving fatal in many instances, and being quickly merged into a fully developed epidemic of cholera.

In the retrospective opinions of many physicians, the fatal sickness of the year was considered to have been a strange intermingling of typhoid fever, dysentery and Asiatic cholera, from the beginning.

With the exception of Professor Hooker and two or three others, all the physicians of the city who had cholera patients treated them in the manner already described, with opium in repeated doses, and small doses of calomel. If any of these cases recovered, they must have been very few, for at this distance of time I am unable to recall any recoveries among them.

The cholera visited us again, with increasing mortality, in the years 1854 and 1855. It was managed as heretofore in various ways, and with similar results. Dr. Hooker's treatment, modified by himself now, to the administration of a single dose of sixty grains of dry calomel, followed by a teaspoonful of water, was adopted by many more physicians in the city and throughout the state, and was almost without an exception successful. It was relied upon with great confidence by those who used it, empirical as it most certainly was. Speculating in later days as to the true significance of the phenomena which occurred under our own critical observation, but without the power of analysis, we could only say, it was simply nature's method of announcing, in her

own unmistakable language, a half discovered scientific truth of the greatest magnitude and importance.

If only there had been among us at that time, I hear some one saying, a mind fitted for the elucidation of all the hidden problems of nature,—trained in the modern methods of scientific research, what wonderful results might have been at once realized! Not so.

The conditions necessary for the perfecting of such a scientific discovery as many may now think the facts observed plainly led up to, did not then exist. A new and unknown contagious and infectious disease, that appears upon the continent only at rare and uncertain intervals, leaving death and destruction in its path, disappearing when its work is ended, as suddenly as it came, offers few opportunities for its continued and philosophical investigation.

Life is too short,—and the successive generations of mankind are not long enough for the study and solution of all the mysteries of Nature.

The established fact of recent years, that the mercurial chloride is probably the most effective, and certainly the safest germicide known, had of course not been recognized by bacteriologists half a century ago, for as yet there were none,—but the wonderful success of the purely empirical treatment of Asiatic cholera with a single large dose of this mercurial, better known as calomel, served as the text and basis

for numerous discussions by our two friends, while they both lived, as to what was the true philosophy of the infinitely great results of so simple a mode of procedure.

From the earliest records of popular beliefs, down to the present hour, it has been assumed by mankind, and advocated with a degree of obstinate persistence equalled only by the intellectual darkness which prevailed, that all foul smelling odors which could scarcely be inhaled without danger of suffocation, were thereby valuable as potent disinfectants of disease. Amulets and charms of disgusting forms and materials were relied upon for protection against the infection of disease. A chemical combination of an irrespirable gas, chlorine, with lime, used extensively in the arts, has been supposed, because of its powerfully nauseous odor, to be not only a deodorizer, overcoming all other smells, but as being able by virtue of its irrespirable odor to destroy the infectious nature of a communicable contagious disease. So it has come about that, by mistaking the use of language and the proper definition of words, the chloride of lime has acquired, through its power to mask odors, a false reputation as a destroyer of the infection of disease.

Does not every enlightened student of nature know that the only real disinfectants are cleanliness and

ventilation, or the destruction by fire of all fomites? And should a molecule of infectious material escape from confinement, that it is caught up by a freely moving atmosphere, and combining with equivalents of oxygen or other neutralizing elements of the air, enters into new combinations with the atmospheric constituents, and becomes, instead of a menace to human health and life, a natural stimulus to every form of vegetable and animal perfection?

Although a quarter of a century has passed since the inaugural address by Doctor Bronson, as President of the Connecticut Medical Society, was made, circumstances indicate that it can be profitably read by the present generation.

SCIENCE AS A HELPER; INHERITANCE AS A HINDRANCE;
DEATH AS A CONSERVATOR.

The Annual Address delivered before the Convention, May 25th, 1870,

By the President of the Society,

HENRY BRONSON, M.D.

Mr. President and Gentlemen, Members of the Medical Society:

Medicine as a *Science*, or scientific medicine, has been steadily, or with slight interruptions, improving since the dawn of civilization, and during the present century has made rapid progress. Facts from many departments of inquiry have been collected and classified, nature has been interrogated by experiment, laws have been ascertained and principles settled. Hundreds or thousands of enthusiastic, tireless workers of every age and in different countries have devoted their strength

and lives to the study. Whatever energy, patience and talent, aided by the best methods and fittest appliances, could accomplish, has been done.

Anatomy is a branch of medical science which has been prosecuted with complete success, and so far as it relates to the human subject little remains to be known. In the interesting department of Comparative Anatomy, however, without a knowledge of which the human form has little significance, there is yet work enough—enough certainly for the generations of this century and the next. In Microscopical Anatomy, which seeks to know the minute structure of organisms, wonderful conquests have been made, but still greater marvels may yet be disclosed. It is not easy to assign limits to that which human persistence, skillful manipulation and improved instruments may accomplish in this particular field of inquiry. Nor has Physiology, the science of normal living actions, withheld its contributions to scientific medicine. Almost within my own memory, it has come out of the nebulous state, and from an unpropitious beginning has already taken a high rank. Considered in its wider meaning and embracing Comparative Physiology, it is at this moment one of the most pregnant and hopeful of the sciences, giving or promising important aid in the solution of difficult problems. Of Botany, another of the so-called collateral sciences, embracing within its scope plants of priceless value in prescription, I need only speak as the chosen pursuit of many zealous and competent men whose labors have been crowned with distinguished success.

Pre-eminent among the medical sciences stands Chemistry. It has been cultivated with unintermitting assiduity, and a courage that has never faltered. The highest order of genius has been devoted to it, and extraordinary results have been obtained. It has contributed largely to scientific medicine, and imposed on the profession obligations which can neither be forgotten or discharged. Its power and utility have been displayed in the analysis of drugs, the isolation of their active principles, and the modification and improvement of the latter by combination. The discovery of the remarkable class of

substances known as the alkaloids, of which that impatient and revolutionary agent, nitrogen, is the characteristic ingredient, is due to the chemists. A large proportion of our active remedies are now chemicals, the products of the laboratory. The copiousness and variety of our *Materia Medica* as compared with that of our fathers must be ascribed to our friends of the retort and test-tube.

Nor has chemistry been content with these outer, material conquests. Adventurous, confident, sometimes audacious, it has essayed to explain the mysteries of the inner, organic world. Denying the existence of a distinctive vital principle; assuming the living form to be composed of chemical materials, built up, endowed and preserved by simple chemical force, and finally destroyed by chemical action, it has attempted to trace the steps and explain the cause of every movement. Nor have its promises been without a show of performance. In pursuance of a well-defined purpose, its cultivators have, with unequalled diligence and a complete mastery of science, sought to know the composition, phenomena and laws of organized bodies. Remarkable results have followed. The elementary constituents of organic matter have been exactly determined. The atomic constitution of several of its simpler compounds (those chiefly which are destitute of nitrogen and incapable of life) such as starch, sugar, fat, gum, has been clearly shown. By chemical agency, starch is easily converted into sugar, and urea and several other organic bodies formed from inorganic materials. That the difficult questions presented might be satisfactorily answered, all the substances, solids, fluids and gases, which are taken into the system as supplies, or which escape from it as detritus or refuse, have been analyzed and weighed, while the several changes wrought during the transit have been carefully noted. According to the liberal estimate of Professor Draper, a man of ordinary size receives annually, say, eight hundred pounds, avoirdupois, of dry food, eight hundred pounds of oxygen, and fifteen hundred pounds of water, in all more than a ton and a half; and if his weight be stationary, loses by the alimentary canal, kidneys, skin and

lungs, in the form of non-assimilated matters, urea, carbonic acid and water, an equal amount. Every element taken from the world outside is restored to it. The organism can rearrange atoms or molecules, decompose, recombine and rehabilitate compound bodies, but create nothing, destroy nothing. Note the facts.

A plant lives on inorganic matter—water, carbonic acid and ammonia chiefly—heat and light furnishing the extraneous force required. An animal receives into its body organic, highly elaborated, nutritive substances—substances surcharged with chemical force loosely combined and easily appropriated—converts them first into plastic material, then into living tissue, and lastly into lifeless, inorganic matter which, spent of its useful qualities, is cast off. By the last conversion, or during the descent from the organic to the inorganic state, a vast amount of “stored up force” is, as in the case of a falling body, liberated, metamorphosed and utilized. This, like that generated by the gravitating clock-weight or a bent spring, is employed to work the machinery of life. The force thus used manifests itself as muscular, or digestive, or hepatic, or nervous force, etc., or as heat, sensation, emotion, etc. How this change happens—how chemical affinity becomes vital power—we know not. Nor do we know how this same affinity is converted into heat and light by combustion, or into electricity by the galvanic apparatus. We understand, however, some of the conditions which are necessary. That oxygen plays an important part in all these processes is apparent. Oxygen is a powerful chemical agent, and the great instrument of change in the natural world, pulling down the forms which other agencies build up. It is taken into the system in enormous quantity, in weight equal to the dry food received, and diffused throughout all the tissues. The effect of a substance so energetic, let loose in such abundance among the reeking, unstable compounds of the body, must be in a high degree subversive in its action, unless controlled by vital power. Thus controlled—put in harness, as it were—it becomes not only an efficient worker, but an obedient, humble servant. Always at hand, it

in some way, by permission, unites with the carbon contained in the food, the carbonic acid which appears in the expired air furnishing proof of the union. By this combination, heat, or its probable equivalent in other forces, is constantly evolved. The heat increases mobility, facilitates change and keeps the body warm; the other forces are mechanical and vital—muscular, digestive, cerebral, etc. “Whatever amount of power an organism expends in any shape is the correlate and equivalent of a power that was taken into it from without.” [See Spencer’s Principles of Biology.] It is contended that the carbon consumed undergoes a true combustion. The whole of the “stored up” force disengaged is just equal to that which is given out when an equal amount of carbon is “burned,” whether within or without the body. According to the theory, this combustive process disintegrates and destroys portions of vital substance, solid or fluid; organic matter runs down: parts die and are rejected that the remaining whole may live. The explanation is ingenious and plausible in a high degree.

The vital structure is an apparatus so contrived and equipped as to convert inorganic or dead organic into living matter, physical into vital force. It effects this by means of an inherent, special endowment. This endowment is a force, *sui generis*, wholly distinct from those which govern inanimate matter—correlated with them if you please, but as distinct from them as they are from each other. Of its primal source we are wholly ignorant; but that it made its appearance subsequently to the material forces, geological facts well nigh prove. Unlike the latter, it is not necessary to the existence of matter. As we know it, this force always has its beginning in a pre-existing organism, but whether or not a creative act introduced it in the first instance, science does not inform us. In our experience, it is associated exclusively with an organized system, in connection with which it multiplies, develops and perpetuates itself. No known arrangement of material agencies, no artificial combination of appliances, has yet been able to evoke it; at least, this is my belief. A living organ-

ism must be provided before the first or initial step can be taken. Generation does not originate but only continues existence. Chemistry has wrought marvels, but up to this time has not endowed with life a single particle of matter. I may be mistaken, but these are my convictions after having examined the facts. I do not claim that "spontaneous generation," so called, is impossible, but that it has not been proved.

To say that vital force is nothing more than chemical force slightly disguised, as those chemists whose minds have been too exclusively occupied by their own science often do, is without warrant, and an abuse of language. With as much propriety might it be claimed that the force expended in the formation of a crystal is vital force. The two are easily distinguished. Each has its appointed sphere, and acts in its own way ; each produces compounds and phenomena and groupings of the latter which are peculiar and specific. Nor do they exercise a divided sway. In its own proper field of action, each rules supreme so long as it rules at all. In the cases in which one disappears, and the other is installed in its place, there is no union or blending, but a true metamorphosis and conversion. Why overlook all these and many other proofs of a diverse nature? Why contend that one does the work of both, or that the other has no existence? The proficient in chemistry will not permit the physiologist to enter his laboratory, and to insist without protest that the force which there rules is not chemical, but vital—that the chemical principle, so-called, is a myth, or plays a secondary and subordinate part in every case, and that vitality acting under new conditions is the true cause of every phenomenon. Chemists who are jealous of their own rights should not claim for themselves what they are unwilling to yield to others.

Though the collateral sciences have sometimes suffered from misdirected labor, it cannot be denied that they have reared vast and solid structures of natural truth. In the matter of work, they have done their part, but has practical medicine been profited to the extent expected? Has the latter, as a

general rule, been able to appropriate and utilize the important facts which have been placed within its reach? With all our new acquisitions, can we prolong life, cut short disease, or restore health with any certainty? Are our methods of cure as much superior to those of our fathers as our science is more complete? Has the healing art kept pace with the other arts which owe their advanced position to modern discovery? To all these questions—I say it with sorrow, not with shame—a negative answer must be returned. Too often have we been unable to make our greater knowledge contribute in any considerable degree to our resources, or indeed to connect it with the ends for which we labor. Hence there is often a broad gulf between our science and our practice. Anatomy, Physiology, Microscopy, Chemistry, etc., do not qualify us to foretell without error the course of events in the interior of the system, especially when the natural actions have been suspended or perverted by disease. Not knowing what events may turn up, we can make no adequate provision against impending dangers. Often they come upon us suddenly and unexpectedly when no preparation was possible. The thick darkness which hangs over the future of us all, no mortal eye, no human sagacity, has yet penetrated. Sometimes a man drops dead in the street when no one knew he was ill, and when the scalpel makes no important disclosure. Another sinks rapidly from a slight injury or surgical operation, or other seemingly insufficient cause. These accidents, so-called, or special providences, as many suppose, do not occur in the inorganic world. The physicist often knows as much of the future as the past. Foreseeing what will happen, he can anticipate and forestall events. The chemist will tell you distinctly how a familiar substance will behave when submitted to experiment—carbonate of lime for instance, when placed in dilute sulphuric acid. Consequently, he can provide without accident for whatever may come. Taking a bold stand, he can not only predict confidently, but bring prophecy to pass.

It is otherwise with the physician. He hesitates, and if he is wise speaks cautiously, trembling for results. However well

he may know a family of children, he cannot tell how they will be affected by exposure to scarlet fever, what course the disease will take, how opium, calomel or capsicum may influence its progress, or what the sequels may be in each case. The same remedy, given apparently under the same circumstances, will not always produce the same effects. Embarrassed with doubt, he cannot prescribe without anxiety for severe sickness, not knowing what a day or an hour may bring forth. If prudent, he temporizes and palliates till the sky clears up; waits for developments, watches symptoms and proceeds warily, feeling that his feet are on slippery ground. If he give medicine, his efforts are at first tentative. It is not till the disease assumes a regular type—till life returns to familiar channels, and the end can be seen—that his step becomes assured. Suppose in a critical case he pursue a bolder course, and attempt to arrest morbid action by strong practice. Whilst he waits with painful solicitude for suitable effects, straining his eyes to catch the faintest glimpse of a coming change, he cannot but notice that events come and go at their own sweet will, or are guided by a hand stronger than his. Dimly discerned behind the curtain, there sits a dreaded, unrelenting, mysterious power which resists his efforts and thwarts his aims. Against such odds, is it strange that the physician gives up the contest, or seeks refuge in what is termed the expectant method—a method which follows hopefully and submissively instead of taking the lead and cleaving a way for escape? It is certain that the practitioner can sometimes best serve the sick by curbing his impatience, and declining to interfere. Pursuing this course, he gives his attention to minor points, and waits for new revelations, trusting for safety to movements which he does not comprehend, and which he can neither initiate or delay. I know not a more painful situation, or one better calculated to humble a proud, self-sufficient man than that of the trusted medical adviser who, comprehending the danger, is obliged to sit by the bedside of sickness, the observed of all, without lifting a finger.

The limited influence of our art—its complete subordination to a higher law—is well illustrated by the uniformity which characterizes sickness and death. Not only do all men die, but each dies of some particular disease which we are taught to resist, and which the world thinks we ought to cure. The causes of mortality act with so much regularity that the rate of the latter may be precisely known. On the fact that out of a thousand persons of a given age, a certain number will die annually, in spite of the healing art, the system of life insurance is founded. That the risk may be accurately computed is proved by the practice of business men who issue life-policies at fixed prices, staking their dollars on the result. They do not find their calculations overturned by supposed improvements in medicine. Or, if we take a particular disease indigenous to a country, the deaths from it will be found to bear a nearly uniform ratio to the deaths from all diseases. For consumption, this ratio in Connecticut is about one to six and a third. But the death rate among a people does not seem to be dependent on any of the usual forms of sickness. Were phthisis, typhoid fever, dysentery, cholera infantum, etc., to become wholly extinct, I suppose that new disorders equally destructive to the same classes as nearly the same age would be introduced. A sweeping epidemic which proves fatal to large numbers is usually followed by unwonted health. It weeds out the vitally infirm, killing off those who would soon have perished from other causes. The decreased mortality which is the immediate result makes up for the previous increase, leaving the rate for the whole period unaffected.

It cannot be said that our insufficiency as physicians and frequent defeat are due to any lack of ability, or courage, or persistence in the profession. We have had in our ranks our full proportion of eminent men—men of profound judgment and gifted intellect. Trained to their vocation, they are keen observers and cautious reasoners. No class of workers has surpassed them in industry, zeal and self-sacrifice. The phenomena of disease, its origin, history, characteristics, complications and results have been studied with determined resolu-

tion. Remedies have been sought the world over, and their properties and effects carefully examined; while skillful therapeutists have spent their lives in the endeavor to apply them to practice. Facts, so-called, have been accumulated in bewildering profusion, and books written nearly enough to freight a planet.

All these things well considered lead to the conclusion that a wrong estimate has been put upon the difficulties of our art. These difficulties are extraordinary in kind and degree, and wholly different from those met with in the physical world. For them and their invincible character, our profession is not responsible. The nature of the obstacles which confront us at every step not only account for our short-comings, but vindicate us fully. Though often overmatched, considering the heavy load which has been placed upon us, we need not be ashamed. This conceded, let us no longer foster delusion, hoping for the impossible, but endeavor to ascertain what are the hindrances to the healing art—what their nature—what their causes and extent? What are the limits of our power to cure, and why are we thus limited? What is the law which interposes when more is attempted than can be accomplished? I may not be able to reply to all these questions, but I can answer some, and give reasons, perhaps, for not answering others.

Leaving out of the account some of the simplest organisms, animal life in the individual begins with the fertilized ovum, or rather with the primitive or embryo-cell which the latter incloses. This cell, the product of two other cells called sexual, at first a mere speck of semi-fluid, albuminous matter, without discernable structure, has at the start but a single faculty, that of drawing to itself and appropriating nutritive matter, and the force required for transmutation, etc. By means of additions thus made, it contrives to gain in size and strength, or to grow. Simultaneously with this increase, and keeping pace with it, there is differentiation, the parts becoming unlike. To the eye, the first change is indicated by the "segmentation of the yolk." Then comes the "mulberry

mass," then the "blastodermic membrane," then the "primitive trace," then the dim outline of central organs, and so on, the process up to a certain point being the same in all animals. The characters which distinguish the class, order, genus and species appear in regular succession. Always impelled by outside influences, the organism is forever in a state of transition, passing from one stage to another. Originally simple in form, homogeneous in structure, and indefinite in its characters, it becomes daily or hourly more complex, more heterogeneous, more definite. Out of the confusion formed by continuous integration and transformation, the body of the young animal at length emerges. Organs, functions and faculties are unfolded and elaborated, one after another, till the work is complete. This proceeding from the general to the special, from a lower to a higher sphere, through successive differentiations, is called *Development* or *Evolution*. This continues till the prescribed limit of perfection has been reached, when a retrograde movement, not over the line of advancement but toward weakness and decay, commences. This downward plunge does not seem to be caused, as the chemists suppose, by the unresisted action of chemical forces. The end is reached through differentiations as regular and distinctive as those which marked the ascent, and wholly unlike anything which unassisted chemistry can produce. The organism during the whole period of its fall is active, not passive. Nor does the body *wear* out, as popular opinion supposes. If wear, so-called, is to be measured by waste, then the greater it is the more vigorous the functions, and *vice versa*. Life, in its normal state, is in truth strong and active in proportion to the expenditure, and to a large extent in consequence of it. Properly speaking, there is no wear in the working of life's machinery, and consequently no loss by attrition. The duration of individual existence is determined by vital, not chemical or mechanical laws. Immediately, if I mistake not, it depends on the limitation which nature has imposed on the power of cell-multiplication, by which repairs are effected and the tissues renovated. This power, renewed, rejuvenated and refreshed

by the generative act, is always energetic till maturity is reached, when, at the very point of greatest perfection, and when decay seemed most remote, it begins to show weakness which gradually increases till cell-genesis and the life which depends on it becomes precarious and finally impossible.

That we may better understand the nature of development, I will go back to the facts which stand at the head of the developmental series. However a species may have originated, whether it began life as a single cell or as a more complex structure, this primitive organism, once in existence, would be acted on and modified—its equilibrium disturbed—by environmental influences. Having, by the supposition, no hereditary bias, and restricted only by intrinsic causes and its own essential nature, it would of necessity be impelled in the direction given by these influences, or in the line, if you please, of least resistance. These outer agencies—air, light, heat, moisture, food, etc., acting singly or jointly, would cause new molecular arrangements or inner change, and with change would come differentiation, the first step of development. A slight change in the environment (which is always varying) would cause further change in the organism. Thus the second step would be taken. Continued change would by the same rule produce continued differentiation, ending, under the guidance of the constructive principle, in complete development. In this manner the living form is pressed forward, and at the same time molded and fashioned by external influences, its successive conditions or history representing and reflecting the latter. I shall not follow up this idea; but the effect of these reactionary movements and the developmental changes which follow is to bring life into greater harmony with the world outside. This harmony—in progressive races more complete in each succeeding generation—is made possible by the yielding, obsequious character of the nascent organism. When the latter becomes unyielding—rigid, say, from age—or when its answering actions are irregular and spasmodic, as in disease, the power of adjustment is lost, harmony ceases, and death must soon follow. This correspondence between the organs

and functions and surrounding agents, so conspicuous in nature, and so necessary to animal and vegetal existence, is what is called *adaptation*.

But that which is most nearly related to my present purpose is the fact that modifications of structure, peculiarities of form, and bodily qualities of whatever kind and however produced, re-appear in the offspring. The first pair, having no inheritance, would bequeath only their united personal organizations as it existed at the time of conception. The second generation, commencing life with an hereditary bias, would transmit this together with the modifications which personal causes had produced. The third and subsequent generations would follow the example of the second, each handing down whatever had been received, with the alterations and additions which itself had supplied. Thus an individual is in structure and function but the recapitulation of all that has gone before—an abridgement of his ancestry and of himself, that is of his own history. Uniformity in the environment acting upon successive generations would insure uniformity of organization, giving characters common to the race, and permanent in proportion to their antiquity. During the long life of a species, embracing hundreds or thousands of centuries, these characters become, as it were, immutable. On the other hand, variableness in the outer world is the source of inconstancy in the inner. Inconstant characters are those which distinguish the varieties of a species or sub-species. As a general rule they have a feeble hold of the organism, have a recent origin, and are easily effaced. Fanciers take advantage of this fact when they would introduce a new breed.

Not only is the organization bequeathed, but the order of events and the time occupied by each of the several series are transmitted, the parental type being preserved. The family pattern, whatever it may be, is faithfully copied, and all its modifications successively adopted. In virtue of its inherited endowment, the embryo-cell runs a definite career, definite in its stages and duration, and definite in every one of its characteristics. In each step of its progress it is under constraint—

hemmed in by limits, and bound down by forms which it cannot break over. Always starting from the same point, it is driven forward helplessly in the course marked out for it; undergoes all the changes and transformations peculiar to its kind, and does not fail to arrive at the different stages "on time." An unseen influence guides it; a law which no scalpel or microscope or other appliance can reveal, presides over it. External violence or internal defects may cut short its course, but no cause consistent with healthy movement can materially change its direction or hinder its progress. Nor can the order fixed by heritage be reversed. Maturity is reached by innumerable successive differentiations, every one of which is made possible by some preceding differentiation.

Structure carries with it function, and all the qualities which appertain to a living organism. If the former be inherited, so are the latter. Each of the organs and faculties exhibits the family likeness, follows in the footsteps of its predecessors, and acts as it has been accustomed to time out of mind, without much reference to present ownership. In truth, faculties are handed down entire and without a break from one generation to another. Though intermitting in activity, as in the sleeping and embryonic states, strictly speaking they never die. Appetites, propensities, instincts, aptitudes, tendencies, modes of thinking and habits of action, all live in the offspring. Not only are the prime facts of individual life determined by descent, but minor events, including those dependent proximately on the will, have to a large extent the same origin. Travelers speak of certain wild birds which, allowing themselves to be approached till experience has taught the danger, bear offspring which, untaught, fly away alarmed at the sight of man. According to the Westminster Review, referred to by Dr. Elam, a dog taught to *beg* bore a puppy which, though taken from its mother at six weeks, spontaneously took to begging at the end of seven or eight months. One day it was found before a rabbit hutch "begging" for the rabbits. The playful acts of the kitten are not those of the mother when grown up, but of the mother in its kittenhood, this fact proving that they are not imitative but hereditary.

In essential points, one's history is written in the embryo-cell from which he springs. There will be found the causes of the good and evil which attend him. There are planted the seeds of disease and decay. If health and long life await him, there will be found the reason for them. If the embryo-form be imperfect or poorly endowed, a sickly life and early death may be expected. In no event can the stream be purer than the fountain. I do not mean to say that a man's personal environment and his own spontaneity can have no effect on his destiny, but that he starts with specific tendencies, a bias, a pressure in the rear which will usually control the result. If he begins life with broken machinery or a constitution fundamentally imperfect, the defects can never be repaired. In a case of this kind, development may be arrested at any time, slight accidents will produce extraordinary effects, certain functions will be discharged with difficulty, and fatal disease will appear prematurely, perhaps suddenly. Complaints which are not commonly hazardous, like measles, whooping cough, mumps, etc., may prove mortal. If there be a particular family taint or tendency, tuberculous, cancerous, rheumatic, anthrithic, maniacal, epileptic, apoplectic, calculous, etc., the appropriate symptoms will probably show themselves in due time, and at about the same age as in the parent.* Sometimes all the issue of the same pair will be cut off in infancy by hydrocephalus or convulsions, or soon after puberty by consumption.

* For the unwelcome ills which come upon us, we are prone to look exclusively to outside influences—heat, cold, dampness, changes in the weather, errors of diet, poisons in the air, or in our food and drink, etc., and to forget the causes which are wrapped up in our own bodies. Because a chill or sense of chilliness marks the access of a large proportion of the maladies which afflict humanity, the mistaken masses and some poor physicians suppose that clean, cool, fresh air is the great enemy of the race, and that "colds," so-called, lay the foundations for most of our diseases. It is well to provide, as in most cases we may, for the substantial dangers which surround us, but not wise to mistake for them those ever-present evils which are connected with a crippled organization—evils which are congenital and hereditary, against which no adequate provision can be made.

Now here lie the difficulties which beset the physician. Nearly all the diseases he is called on to treat are, more or less, openly or otherwise, hereditary. Even those which are apparently due to personal causes owe their peculiar characteristics and perverseness to parentage. Death itself is a heritage. Not only that, but the time of its occurrence is fixed approximately by descent. With the most perfect organization, and under the most favorable circumstances, a man loses his vigor at a certain age, grows more and more feeble, and dies when his original stock of vitality is exhausted. To appearance he is destroyed by some familiar complaint, but really by a cause which lies far deeper—a cause which has its roots in the remote past. He has run the career of his race; has reached the ancestral limit, and escapes by the avenue which is most convenient or accessible. If that had been closed, another would have been found. The particular disease is but the transient form which the departing life assumes, and to expect to cure it, however mild it may at first appear, is not reasonable. Medicine in such cases may not be useless, but strong drugs are out of place. Other disorders occurring in early or middle life, and due to hereditary faults, are often to be regarded more as evidence that our years have been numbered and will ere long expire, than as temporary perturbations to be removed. In these instances, were it possible in appearance to restore health, our patients would soon die of other and perverser maladies, and we might lose the credit won in previous illnesses. There are physicians in practice who, if their word must be taken, “never lost a case when called in season.” They are knaves and quacks, and deserve our contempt as deceivers, no matter what their diplomas may say in Latin. All our patients, however adroitly managed, will die sooner or later, either under our treatment or that of others perhaps equally skillful. If given to vaunting, we may promise to cure every disease but the last. Further than this we cannot safely go; more than this our friends cannot reasonably ask. As our power to heal is limited, so is our power to slay. Men sick before their time will usually get well under almost any treatment, the worst included.

In one point of view, it may be considered fortunate that we know no more of the real significance of our infirmities—no more of the prescribed length of our days, and the connection which impending diseases have with our final doom. Perfect knowledge might extinguish hope so necessary to our comfort, discourage proper effort, and give rise to self-destroying despair. Much can be done by suitable medication to remove irritation, assuage pain, encourage sleep, and promote the general good, even when recovery is impossible. In all these cases, an intelligent, truthful physician is needed in the sick-room—needed to keep imposters out, if for nothing else.

Purposely in my preceding remarks have I omitted to notice certain apparent irregularities in the law of descent. Those permanent and essential characters which distinguish natural classes, orders, genera and species are transmitted infallibly and entire; but the fact is sometimes otherwise with the qualities which mark the variety. The latter are produced by temporary causes and, as already suggested, are unstable, superficial and uncertain. They make one individual to differ from another, and are personal in their nature. To this group belong all those bodily imperfections and tendencies which may by any means be eliminated. In these personal and commonly transient peculiarities, one is more likely to resemble parents than grandparents or remoter kindred, but the reverse is occasionally true, the result being determined by deflecting influences. A peculiar conformation or infirmity which has once appeared in a family, and which seemed forever lost, may reappear after a long interval. Thus a person may receive and transmit what he did not seemingly possess. Some of these cases of "reversion"—cases in which individuals resume ancestral types—are explained by supposing that the family mark, whatever it may be, remains latent till called forth by the exciting causes which are necessary to convert functional tendency into functional activity, or say, predisposition into disease. In other instances, however, this explanation may not apply, as when a malformation or a supernumerary member is withheld from the children, but appears in the grand-

children, etc. Irregularities of this and other kinds are doubtless connected with the fact that only one of the progenitors is, as a common thing, abnormally formed. The father may determine the organization of the first generation, the mother of the second, and *vice versa*, the result depending, often in an unknown way, on the foreign blood which marriage has introduced. However frequent these divergences from the usual order, and however difficult it may be to interpret them, the general law, in conformity to which organic peculiarities are transmitted, is not annulled. I have not room to say more on this interesting branch of my subject.

Though those alterations of structure and perversions of function growing out of our limited career, or which have been fixed in the organization by heritage (producing diseases in their nature critical,) are beyond the reach of medicine, there are many disorders of a milder type, the result of recent, mostly personal causes, which are more tractable. These may be relieved by appropriate medical treatment,* aided by suitable regimen; but as a general rule, a permanent cure cannot be expected while the causes are in operation. These causes, often social, sometimes endemic or climatic, are all those which act detrimentally on the individual, lowering the tone of the system, and contaminating the sources of vitality. Often they may be removed by changes in the environment—sometimes by the scavenger alone—and their effects counteracted by medicine. On the subject of hygiene, the intelligent physician can speak with authority, and make his influence felt. He should take the lead in the great work of purification and reformation, strengthening the hands of the civil authorities, sewerage committees, temperance advocates and moral reformers.

* Medicines are among the environing influences which art may employ to modify and mold the functions, and counteract the effects of morbid agencies. Though incapable of subverting the movements determined by ancestry, and thus changing the destiny of the individual, though possessed of but half the power for good ascribed to them by professional enthusiasts, they are still sufficient for much useful work in their limited sphere.

Hereditary and constitutional vices—those which prevent the organism reaching maturity—run themselves out; and thus the race is preserved. In sick-room phrase, they act as a purge, and secure their own expulsion. If they are so flagrant as to destroy the individual before the marriageable age, transmission and perpetuity are of course impossible. If they be of a milder grade, and take life at a somewhat later period, fewer children are born, and these owing to congenital deficiencies will in most cases die before puberty. Sometimes, as in the case of idiots, imperfection is attended by infertility. Thus poisons of whatever kind, incompleteness and insufficiency of every degree are eliminated; not always in one or two generations, but ultimately. This process of self-purification, by which corrupt and corrupting elements are disintegrated and ejected, is forever going on. Were it otherwise, were infirmity and incompetency handed down with as much certainty as the opposite qualities, mankind would become hopelessly degenerate. To prevent this result, “nature,” so-called, which is never sentimental, cuts off ruthlessly and casts out the worthless specimens, preserving only the soundest and best. This is what Mr. Darwin calls, not happily, “natural selection”—a doctrine which I have preached, in my poor way, twenty-five years. “The survival of the fittest,” as the general fact is succinctly described, not only preserves but tends to improve all living races. By the operation of this law, the “most favored individuals”—those whose circumstances and natural endowments give them an advantage in “the struggle for life”—are left in possession of the field, and would become the sole representatives of the species were it not for the constant intrusion of debasing elements. Filthy habits, crowded tenements, hurtful occupations and practices, luxury and privation, intemperance and other excesses, acting upon each generation, are a perpetual drag on humanity, forever undoing the work of improvement and reform, and keeping the standard low.

In savage life, the conservative principle acts with more certainty and fewer hindrances than in the civilized state.

The wild man is too poor in invention and resources to command many of the means of excess. Enervating luxuries and several of the social vices are unknown to him. His life is but a prolonged battle with hardships, a ceaseless struggle for existence, in which none but the toughest can prevail. Those not well qualified for this prospective warfare—the sickly, the weakly, the incompetent—perish in infancy or are crushed out in the process of training. Only the strongest and ablest, the fleetest, most skillful and sagacious, those who can longest endure privation and exertion, and who are best able to contend with wild beasts and hostile tribes, are likely to reach manhood and have children.

But in the civilized condition, heavier burdens are imposed on the conservative and eliminative process. A highly artificial society introduces many degrading elements and sundry new diseases. The poor suffer from overwork, unhealthy trades, want and exposure; the rich from indolence, overfeeding, anxiety about property and health, injurious practices and fashionable follies of every name; and all classes from ungoverned passions, drunkenness, licentiousness and a hundred vices. These causes, many of them peculiar to an advanced civilization, lay the foundation for disorders and calamities in great variety. Not only this, but persistent efforts are made to interfere with the work of depuration, and to keep the poison as long as possible in the social system. These efforts are prompted by the holiest instincts of our nature, but aim at a scarcely attainable object. Among the needy, the children of worthless or vicious parents die early, partly perhaps for the want of suitable care; but with the affluent, the same class may receive unwearied attention, the poorer the specimen the greater the diligence. The services of doctor, nurses, grandmothers and maiden aunts are secured. The maternal bosom, underlying perhaps a useless lacteal apparatus, is torn with forebodings of disaster. If the child survive the storms of babyhood, new dangers loom up in the form of bumps, scratches, whooping cough, measles, mumps, etc., and every footstep must be watched by hireling attend-

ants. Those moderate vicissitudes and irregularities in the environment which excite temporary perturbations and healthful reactions, and which are indispensable to continued differentiation and complete development, are considered as enemies to be guarded against—guarded against on the false and mischievous plea that the more regular the habits, and the more uniform the life, the greater is the chance of survival. The organism which cannot bear the alternations which are the conditions of growth is doomed to perish—the sooner, perhaps, for the means used to save it.

The marriage of an unsound to a sound person will not eradicate a constitutional evil, but only tend to diffuse and perpetuate it. If in such a case the better stock should have a preponderating influence, and children are born who in their turn have viable children, the mischief is for the time fixed. Without losing any of its qualities, it is divided among many descendants, and though concealed from view, it still exists in a latent state, and will, sooner or later, probably make its way to the light. In pairing there is, in the long run, as much lost on one side as gained on the other. Pairing alone can never remove corrupted blood, or change its essential characters, however much it may dilute it. Wherever this exists, there lurks a poison—a poison which must be expelled before safety is secured. Premature death is the natural remedy. I do not deny that there may be, in particular instances, some advantages from dilution. The contaminating elements may perhaps be so mollified and weakened by a large infusion of healthy material that favorable environing influences, inclusive of needful medical treatment, may at length cause their elimination without the loss of life. But such a result can only be attained by persistent good management, and a fortunate concurrence of circumstances. If the radically defective must marry, perhaps the wisest course would be to choose for partners those most like themselves, thus concentrating instead of spreading the evil. In this way a family would become extinct, but the race would prosper.

Children receiving a structure essentially faulty are exposed to danger at every step. Disease in a decided form is produced

by causes apparently trivial; medicines do not give the customary relief; and death follows, perhaps when no good reason for it can be assigned. Some busybody thinks it strange the doctor cannot cure so simple a complaint as catarrhal fever, or sore throat, or "a cold in the bowels." Perhaps the prescriber thinks so too, but some good soul more charitable than either attributes the result to an "inscrutable Providence." The religious view is in accordance with the fundamental facts. Providence, whose ways are inscrutable to the afflicted, sacrifices a limited good that something better may be secured—kills off the individual that the race may live. Thus a great law, harsh in its execution but beneficent in its results, is vindicated. Death on account of our fathers' guilt or misfortune, death in any case, is a cruel remedy, but it is effectual, and should commend itself to those who are fond of the "heroic" in medicine. It should be regarded not as a penalty, but as a means of salvation. Viewed in the broad light of humanity, the loss of a single immature life is of small account compared with the wide-spread evils which it might inflict—evils which could only be removed at a fearful cost. These reflections may not assuage the grief of bereaved friends, but science is satisfied when it has set forth the facts and declared the law. I suppose a very large majority of the deaths in infancy and childhood, particularly in the large cities, is due immediately to ineradicable vices of the constitution, hereditary and acquired, and remotely to an effort to remove from the social system unclean and destructive elements.

You see, gentlemen, where the current of thought has drifted us. You see the great cost of removing faults of organization by nature's method. In view of the facts, the question is here forced upon us whether the ends now imperfectly secured by means involving so frightful a "slaughter of the innocents" may not be attained in a better way. You will anticipate me when I answer: A better way is known, and only the consenting will is required to follow it. If a farmer be particular about his herds and flocks, he excludes from among them all the

unsound and base-born. Would he improve their quality? He selects the best—the healthiest, the handsomest, the most intelligent, the more docile and teachable, etc., and breeds from these exclusively till the end is attained. Sometimes he sets up an ideal standard, and with this in his eye selects and rejects with the assurance of reaching it. If he buy an animal, he must know its pedigree. To allow a scurvy, ill-favored brute to mingle its impure blood with that of the elect would defeat his purpose and spoil his stock. Thus in a few generations he obtains superior varieties of horses, horned cattle, sheep, pigs and poultry, all of them vigorous. In the same manner, any particular organ or set of organs, any natural function, faculty or instinct may be developed. In this way, his horses become good travelers and his cows good milkers; his sheep bear fine fleeces, his pigs fat easily, and his hens produce eggs abundantly. Any slight variation in the form of the skeleton, shape of the head, length of the body or limbs, size and strength of certain muscles, etc., may be increased by successive small accumulations till it becomes a marked divergency, and a permanent variety is established. The initial change which is the first in the process of variation is often produced without special intention by exposing an organism to new conditions—a wild animal or plant, for example, to the influences of domestication. The wide departures from the natural standard which have already resulted from these influences aided by selection may be seen in the achievements of the dog-breeders, the pigeon-fanciers, the fruit-raisers, the flower-culturists, etc. Under their management, the living structure is like clay in the hands of the potter. If there be limits to their power, (which I dare not deny,) no one knows what they are.

From our present point of view, man does not differ from the organisms below him, one law governing all. He has functions, of which nutrition is the chief, which are exclusively vegetative—common to him and plants. These are first unfolded, for a time make up his whole existence, and through life a large and essential part of it. He has other functions dependent on a nervous system which are as distinctly animal. They

connect him intimately with all those living forms which give proofs of sensation and volition. It is not till life is somewhat advanced that he becomes anything more than an animal. The intellectual functions, the third class, make their appearance at a later period, and are usually considered as belonging to man alone, though the rudiments are plainly discernable in the lower animals.

The vegetal and animal functions do not look beyond the good of the individual. The life which they give is in large measure automatic and unconscious, having seemingly little intrinsic value. Nearly all the lower organisms and many of the higher appear to live not for themselves but for others, cotemporaries and successors. Many furnish food for those higher in the scale, while the remainder are mostly occupied in preparing and providing for offspring, in many cases dying as soon as this work is completed. Nature has little regard for individuals; sacrifices them without stint, but provides beyond contingency for the species. The function, distinct from all others, which preserves the race, carries it over from the present to the future, bridging the gulf, as it were, is the reproductive. It is common to all living beings, and secures its end by essentially the same means. Infalible instinct guides it; immutable law presides over it. Man, with all his nobility, is as much dependent on it as the humblest plant or animal, and is exempt from none of its conditions. Were it not for some goodly inheritance it has already secured, and the almost unlimited improvement it makes possible, humanity might well despair.

Our present civilization, whatever else may be said of it, is not what it should be. Though under the influence of the most distinguished appliances, some of them having been in operation for centuries, the average man has been but little improved. We have made great progress in science, theoretical and practical; have increased immensely our power over the natural world; have invented numerous labor-saving machines; have constructed steamboats, railroads and telegraphic cables; built great cities, sinks of vice; established

colleges and free schools ; made politicians and stump orators of our women ; set the negro at liberty and put him in office ; in many cases got rich in worldly goods, and spoken vauntingly of ourselves ; but poverty, ignorance, degradation, pain, disease and rottenness of every name are still rampant. Old evils have sometimes disappeared, but new ones have taken their place. By the road we are now traveling, millennial perfection will never be reached. Our measures to reform the world do not go to the root of the difficulty. With much parade and diversified means, we try to purify the stream, but permit every one to cast "sewage" into the fountain. However thorough the cleansing may be, it must be repeated with every generation, and with very little gain. In this era of the world, in the last third of the nineteenth century, when all the facts are known, our practice should be reformed. The old methods of extirpating evil and improving the species having proved inadequate, suppose now we use a little practical wisdom, and apply the simple but effectual rules of the stock-raiser. While we provide prisons for the "dangerous classes," so-called, and asylums for the unfortunate ; while we take good care of our paupers, and protect ourselves from ruffians, burglars and assassins, let us not forget that "like produces like," and that "an ounce of prevention is worth a pound of cure." I do not say that judicious selection and rejection would at once qualify all men and women for a more exalted sphere, and fit each for heaven. It is not easy to eradicate vices which are the growth of many centuries of savage and civilized life. But as a lover of my race, I would like to see the doctrine of human perfectability—man's capacity for improvement—put to the test. That something may be done to lift him from the mire, and fit him for his proper position in the organic world, is certain. It is not to our credit that we are less anxious for the purity and health of our own lineage than for that of the oftentimes worthless brutes we are accustomed to rear. It is a shame that of all those who die in New Haven, more than one-half, on the average, are the cases of children under ten years, seven-eighths of the latter doubtless from avoidable causes. There is

no sufficient reason—none that can be justified—why disease and death in early life should be so much more frequent in our own race than among our domestic animals that are well cared for. When we remember that the intellect and moral sense, the passions and instincts, vicious propensities, virtuous desires, degrading tastes, and whatever qualities distinguish individuals are seated in the organs, and that the organs within certain not narrow limits may be modified and molded, their vital conditions changed, and their functional exercises controlled by intelligent, persistent breeding, and that those domestic influences which act so injuriously on the offspring—want and wretchedness in the family—will to a large extent be removed by the means which reform and improve parents, our indifference as to the fitness of those who perpetuate the race is not complimentary to our civilization.

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The prevalent belief that the sexual faculty cannot be restrained or directed, that it must always be left to the guidance of a senseless instinct, that all with the necessary outfit, of whatever race or parentage, be they criminals, debauchees, natural cripples or other incurables, vagrants, scoundrels, or outcasts, have the right to representation in the next generation—the right to go about defiling the fountain of our dearest hopes, upsetting all our plans for improvement—is irrational, not to say monstrous. The thought of caging the authors of so much mischief must not now be entertained, for facts prove that the faculty in question will submit to checks. Public opinion does not permit marriage between persons too nearly allied by blood, or between young people whose bodies are not matured by age, partly on the ground that the children might be deformed, or puny and sickly. Popular sentiment in these cases imposes restrictions which are respected because reasonable and proper. I am not about to say what new prohibitions would be useful, or what additions to the statute already in existence should be made. Possibly the evils of which I complain and the remedy are outside the proper sphere of legislation. But a few years ago it was assumed that a government had a right to life, and might use any suitable

means, whether within or without its usual sphere, to preserve it. Our national life, or if you please our national welfare, is in greater peril from reckless breeding than it ever was from rebeldom in arms. I am not certain that anything commensurate with the evils to be corrected or the good to be attained can be done, but our legislators and the sovereigns who elect them should know what are the facts. When all comprehend the situation fully, see plainly the terrible consequences which flow from present customs, we may find out whether a remedy be possible. A determined purpose, guided by wisdom, and modified by accumulating experience, may yet work out important results.

Faithfully have I endeavored to give a correct but very general view of the important topics which have come up for discussion. I have passed over much ground, selecting my path where the foundation seemed secure. For the most part I have avoided debatable questions. At almost every step thoughts were started which I was tempted to follow, but I would not be led aside. Out of the great variety and abundance of facts, I have had no little difficulty in selecting and grouping in an impressive way those best suited to my purpose. Sometimes, out of regard for feelings which I respect, or for prejudices which must be endured, I have spoken less plainly than I might. If, for any reason, I have not told the whole truth, I have said as much probably as will be borne now. Men do not like to be told of their inherited defects, and are not always patient when their right to assume the parental relation is questioned.

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